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The Premier Magazine for Apple Computer Users

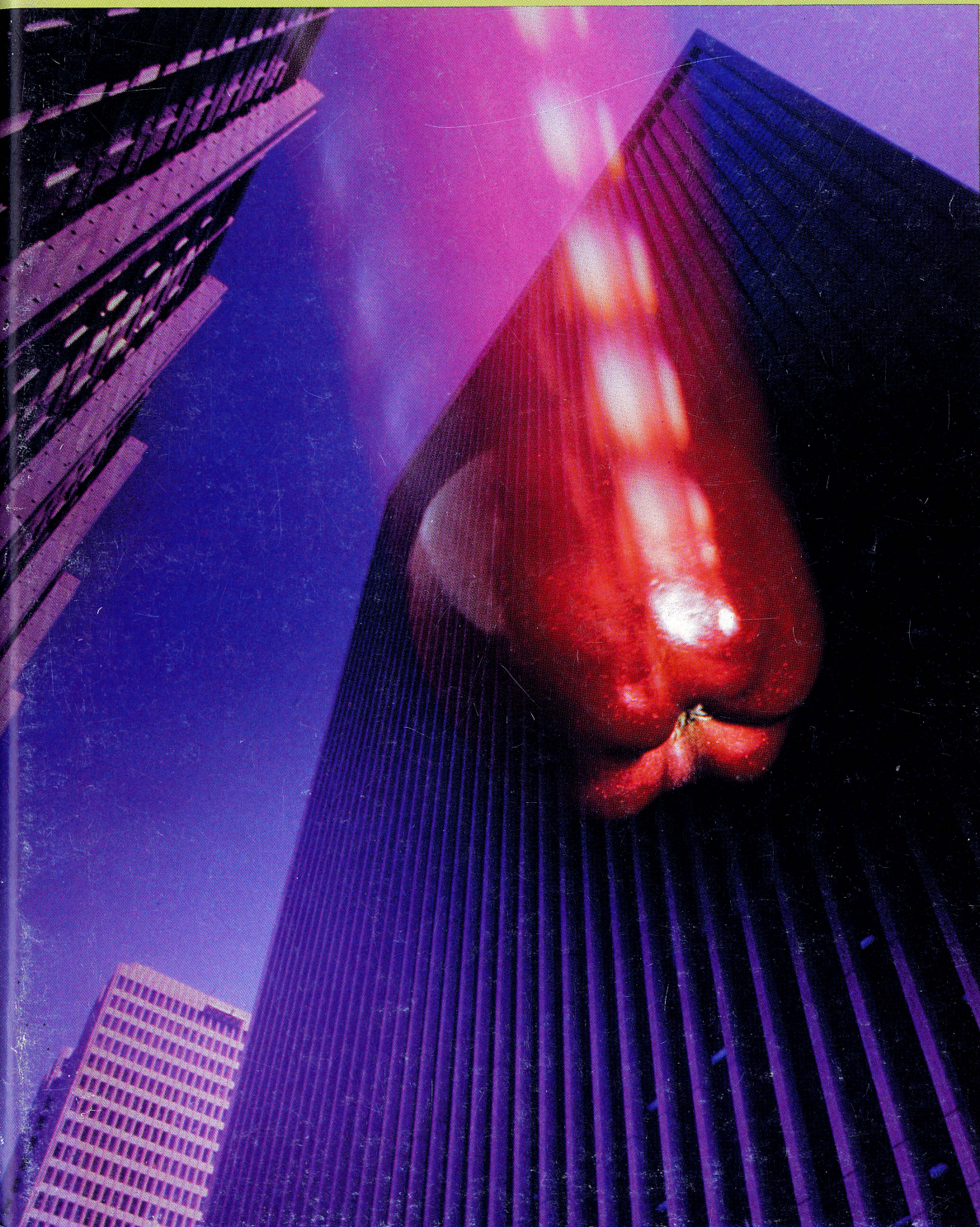
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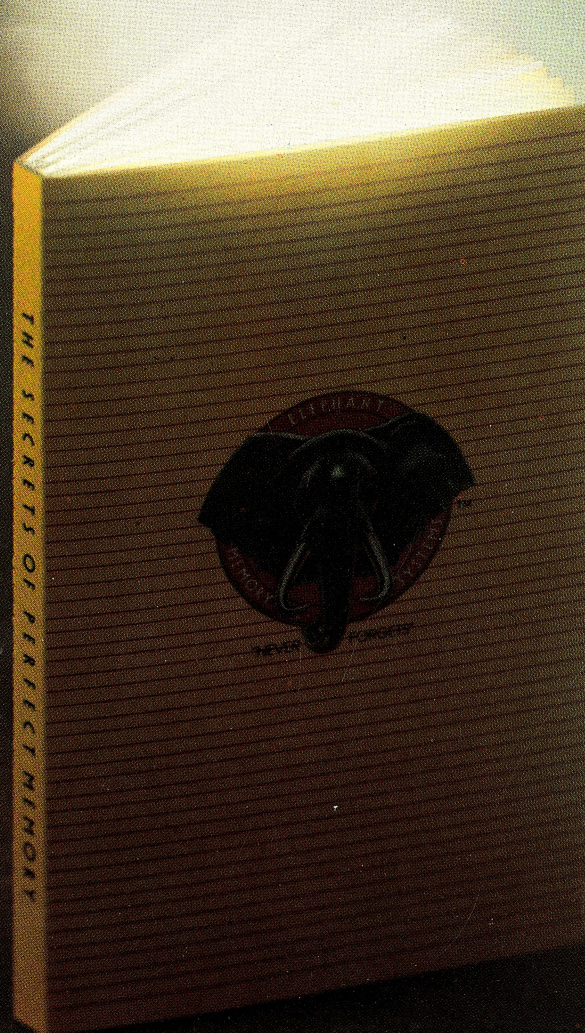
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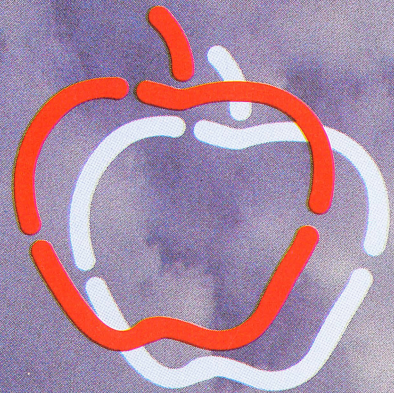


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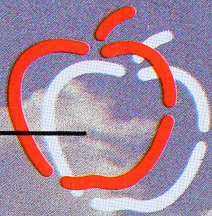
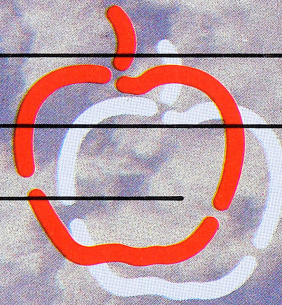
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# Richard

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# Apple Orchard

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## Textfile

Yes, we look a bit different this month; we hope you recognized us. **Apple Orchard** is in the process of revising and improving its graphic layout. The next few months will bring even more changes. Rick Van Genderen has been working with us to make it happen against some "interesting" deadline problems caused by the magazine's growth in size and readership.

Another new item in this issue is the Direct Help Card, which is opposite Page 88. It is designed to do what its name implies: get help for you on a product advertised or included in our *The New Stuff* column. Circle your interest and mail in the card.

Our features this month include a search for speed. The intrepid Neil Lipson wondered what would happen if he used some of the products designed to speed up use of an Apple in combination. The amazing results appear on Page 30. We edited out his claim that his rig now can read files *before* writing to them.

For more details, the Accelerator board for the Apple II is checked out by Barry Bayer on Page 36. Note the IBM comparison with the II. Note also that the Apple ///'s 6502 chip operates at almost twice the speed of the Apple II's, which makes the unadorned /// much faster than the IBM. But nobody knows that.

We do know a little bit about Apple the Company's future, thanks to Don Norris' report on a recent Software Developers' Conference sponsored by Apple. Watch the secret mice scamper across Bruce Tognazzini.

Speaking of secrets, there's WPL, or Word Processing Language, which can be found hiding in every Apple Writer II, //e, or ///. It is amazing how many people haven't tackled WPL yet, and thus only use a third of Apple Writer's capabilities. Well, here's the first article in a Richard Loggins tutorial series on WPL. It's a real eye-opener, because WPL greatly extends Apple Writer's capabilities to meet your unique word processing requirements.

For Apple /// owners specifically, we have two articles this month on drivers, in native mode and in CP/M. For everybody, a personal resource projection program can help chart your future, while one of two new plotters could make the charts prettier. And more.

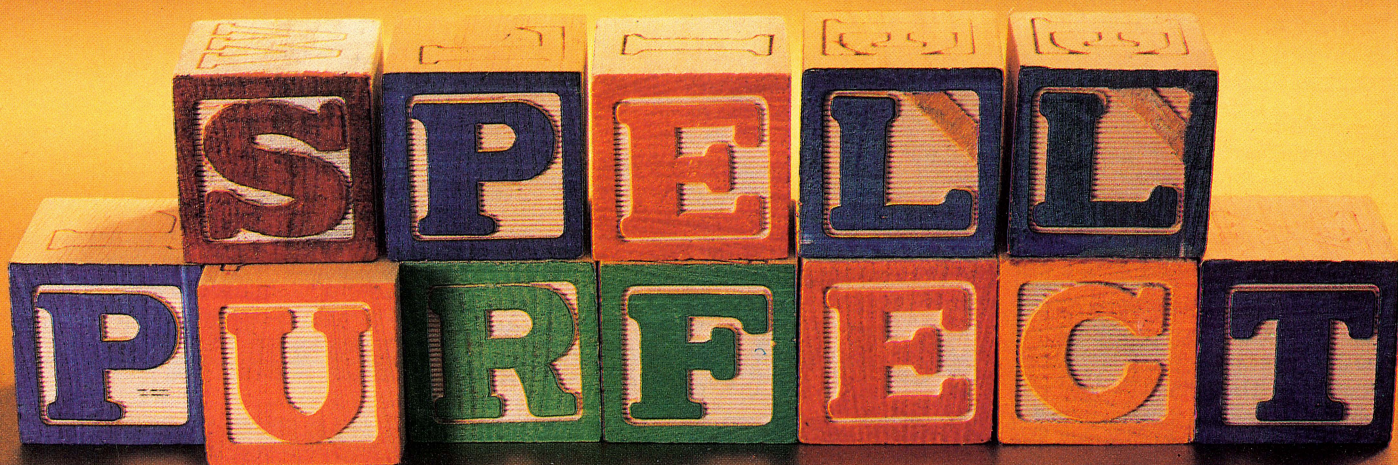
And, of course, there is The New Stuff, which is the most comprehensive new product listing and description you'll find anywhere. These items too are tied into the Help Card as an experiment. (Yes, we used to call that column something else, but let's face it, the old title just wasn't as descriptive. Besides, Weiglin the Editor thought it was time we backed off the Apple puns just a bit. The main thing is that you'll find the info.)

We look forward to hearing from you.





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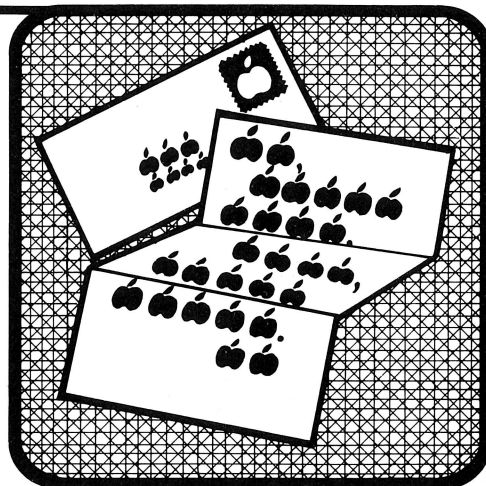
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# Ask Us/ Tell Us

Address your questions, answers, and comments to:

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**We recently installed a small computer system in our (medical) office. Paperwork is down, but some of our patients seem less friendly toward us. How common is this? Can it be lessened? —T. G., Los Angeles**

Once you have a computer system in your office or store you will notice a problem you probably did not anticipate. Your computer is getting in the way of secretary-patient or clerk-customer contact.

This relationship degenerates when the patient talks to your employee, who, at intervals takes time out to bang on the keyboard. The patient or customer is left watching the unattractive back of the computer terminal, a foreign, threatening experience at best. It may be practical for two staff members to handle this problem: one person talks to the patient keeping eye contact while the other enters data in to the computer.

Another technique is to avoid putting the computer between the patient and staff member. Position the terminal on the side of the desk/counter. This allows the patient to directly watch your staff and be watched in turn.

A third technique is to have a small monitor facing the patient or customer, and requesting that he or she check the data for accuracy as it is entered. Thus, the client participates. We'd be happy to hear about any other solutions. —Ellis J. Neiburger, D.D.S.

**My activity at times requires me to send textfiles over a modem, usually on the Source. These files should have a carriage return at least every 80 characters, but my Apple Writer /// files don't have those returns because they're justified on printout. Is there any way I can put in those carriage returns without having to do it one at a time? —L. F., Anderson, IN**

Yes, there is. While it's not highlighted as a feature, Apple Writer /// (and a number of other word processors) can be made to print to a Disk ASCII file instead of a printer, with the format, including carriage returns, inserted as for a printer. One hitch with Apple Writer: the target file name must already be present in the directory when you do this. So, first SAVE the file to disk under its "print" pathname (e.g., ".d2/PRINTLTR"). Must be different from the storage name). Now use CTRL-P, set the print parameters (LM 0, RM 75, etc.) and replace the print destination (PD) ".PRINTER" with the "print" file pathname. At that point, you're "modifying" the "print" file.

Clear memory and Load the "print" file. If you make the carriage returns visible (CTRL-Q;6) you'll see the formatted document. That's sometimes helpful as a preview too. When transmission time comes, send the "print" file. —P.C. Weiglin

**We got a computer system that was touted to do everything. It falls short of our expectations. Shall we junk it? How do we go back to manual simplicity? —F. K., Chicago**

First, consider that just because you have been using a full system, you must de-computerize completely, even though your frustrations impel you in that direction. Better to take a few steps back. Instead of doing all your office functions via computer, do only a few... like client mailing lists or word processing, appointments, etc. There is no rule that requires you to use the computer for every function. Just sit back and get a simple program or two and use it. Perhaps sometime in the future there will appear a full office program that you can use and enjoy... but until then, you can still benefit from computerization.

What happens when your system works perfectly but the hardware has glitches that render life unpleasant? Cut out the defective unit, wind down and sit back until a functioning improvement or replacement is made... then get it and start up.

The important key is that computerization is for your benefit and when it ceases to work well... change. You are not committed to use your system all the time and times do change. If it pays to stop computerizing for a while, do so. You will be able to pick things up a little later on. —Ellis J. Neiburger.

## BASIC Compare ///

BASIC Compare /// is a program which will permit you to compare two Apple /// Business BASIC programs (preferably two versions of the same program) and print the differences on a printer, display on a console, or send to disk. If you do much programming, you will soon find out how useful this can be, especially if you follow the good programming practice of not overwriting the old version of a program with the new.

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# A Look at the Future . . .

## Apple's Independent Software Developer's Conference

by Don Norris

**T**wice a year, Apple Computer puts on a very extensive and thorough series of workshops and seminars for independent software developers. The quality of the information presented by Apple at these four-day workshops makes it very obvious that Apple is committed to supporting and working with the independent software developer. The goal is a broader range of better products for all of us.

The most recent of these conferences took place between August 8 and August 11. System Failure \$06 is in the Apple /// a stack overflow, which is exactly how I felt after attending the sessions. How do you handle a 2 to 3 inch high (paper) stack of information from a four day conference; a stack which could have been even higher if I had picked up *everything* available and been able to attend every workshop.

John Sculley, Apple's new Chief Executive Officer, sounded the general theme. His comments in general: Apple's market positioning is to be the best, not the biggest. Apple would be marketing on a performance basis and not on price. The latter strategy has been pursued by a couple of other computer companies with some disastrous financial results.

### Technical

The conference began Monday afternoon with informal sessions on various topics. Of particular interest to me was the session on integrated software, which has become one of the microcomputer industry's buzz words in recent months. (Various manufacturers are claiming that their approximation of Lisa's integrated approach is "imminent". Sure it is.)

This brought up the question of just what is meant by integrated software. Is it having several functions built into one piece of software, such as a spread sheet, database, and text editing all in one package or the ability to move data from within one program to a different program? The developers present indicated that there was no uniform standard in the industry for data transfer. (*Nor for much of anything else.*—PCW)

The only thing close to a standard means of file transfer and format is an ASCII text file. Everyone generally agreed that while it was not perfect it represented a starting point.

New tools are being developed to make software authors' jobs easier. An example is a new language called Classcal, which has evolved as a result of the Lisa technology. It is a marriage of Simula and/or Smalltalk (plus some other language) and Pascal, and is designed to support object-oriented programming.

Improvements have also been made to existing languages, particularly Pascal. Because these languages are loaded into memory rather than being resident in ROM as they are in some machines, they are easier to upgrade and debug. This gives greater latitude to the programmer; you do not have to make a hardware change when a bug has been cured or an improvement (enhancement) is made to the language.

On the question of Rodents on the //e: Evidently rodent (mouse and beyond) technology is being developed for the Apple II/// product family. This led to an interesting situation later in the morning when several developers started asking

specific questions about the device of Bruce Tognazzini, who was trying valiantly to maintain data security about the new concept. Bruce was unaware that El Presidente had let the mouse out of the bag, so to speak.

### Marketing

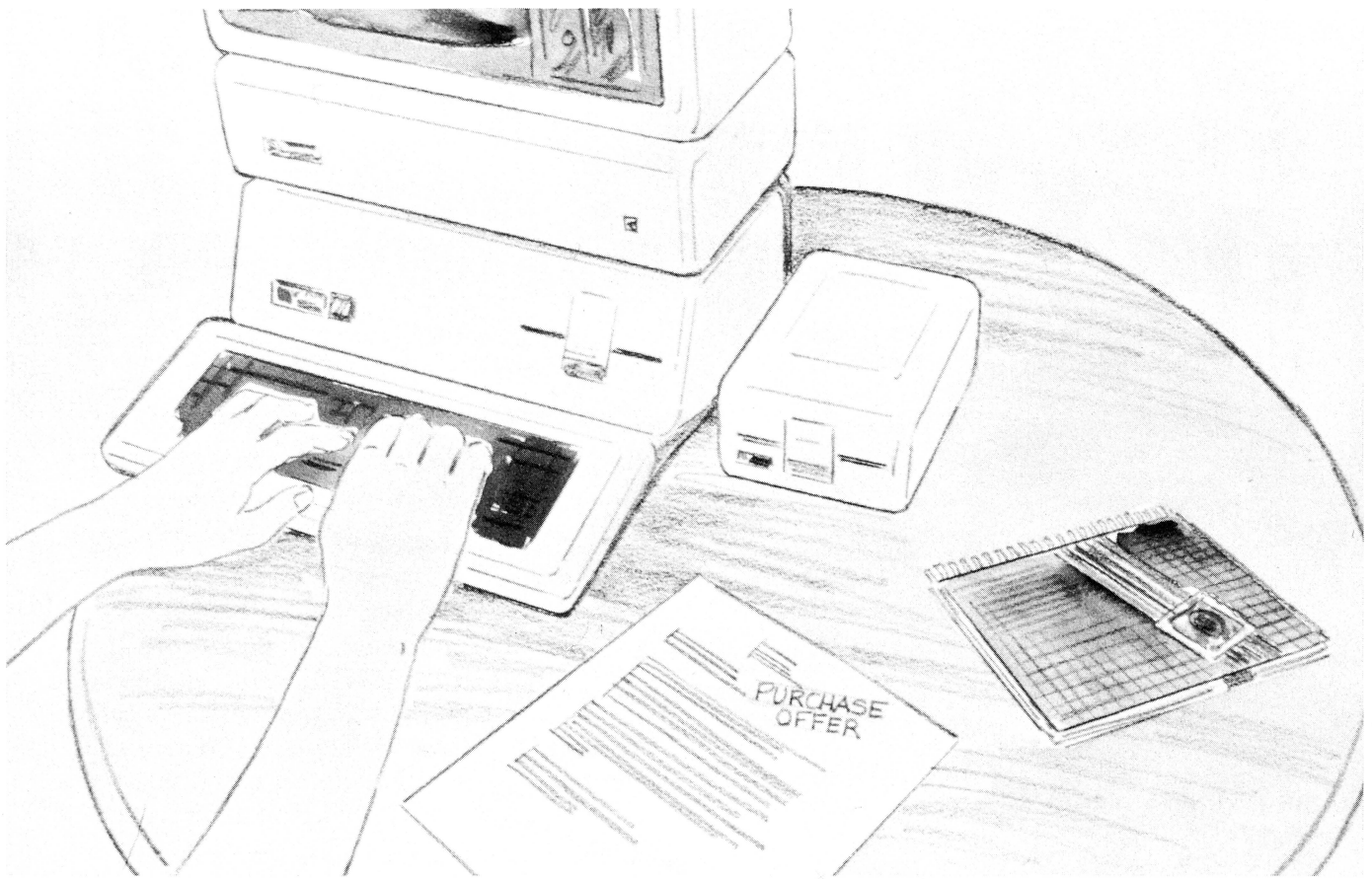
The most startling news was in the area of market penetration: only 7% of the potential market for personal computers has been penetrated.

As to whether the Apple //e or /// had been eclipsed by other machines, the answer from John Sculley was that we have not seen the last model of the Apple // or ///. There will be continuing product improvements, not phaseouts, in the product family which includes the // and the ///. You will see more and faster products in this family in the future.

Particular attention was paid to the Apple ///, in light of industry rumors about the machine's future. A special team has been put together to address the marketing needs of the ///. Apple Vice President Ken Zerbe said the /// had been suffering because it was always under the direction of people with other commitments or people yet to be hired (called "TBH" in Apple land), or was assigned to a department which also had several other responsibilities. Consequently, the /// got lost in the shuffle. Many Apple /// owners had expressed the feeling that they were orphans, and now we know why. We *were* orphans. That should change.

Future product enhancements will greatly enhance the portability of data and software within the //e and /// product family.





## Demonstrations

Wednesday afternoon, various software and hardware vendors and developers demonstrated new products they were going to unveil or already had on the market. Most of these can't be revealed here, but of note to Apple /// owners were high density 5-1/4 inch floppy disk drives from Rana with 652K Bytes and Micro-Sci with 572K Bytes. Both of these drives can be daisy chained onto the ///.

Tim Gill of Quark, Inc. demonstrated Version 2.0 of Catalyst. This new version is much easier to install and to use. It features an inverse cursor over a menu item. The user can then scroll to the program he wants to use, and merely press «RETURN» to run the desired program. Previously to use Catalyst you had to add every driver you might need for any program onto the Catalyst Boot Diskette SOS.Driver file. This meant that when using VisiCalc, the RS-232 driver and any graphics drivers would have to be on the boot diskette and loaded into memory even though they would not be needed by the program. Another addition to the Catalyst Menu is the ability to exit to Lobotomy (Apple II Emulation)

Mode and turn your 256 K Apple /// into 48K Apple II without rebooting.

One question asked of a software developer was, "Why aren't you developing software for the 'other horse' (presumably Baby Blue) as well?". The reply was that Blue provided no developer support, saying only, "Here is the gray box, you write your software for it."

Another developer criticized Apple's low disk storage capacity, saying that he was working with IBM because, "I will not put on the market software for an Apple which requires multiple disks when I can market for the other machines on one diskette, thus making it much easier for the ultimate user."

Regarding the ultimate end user and disk storage, this was stated to be an item of great priority within Apple now since Unifile and Duofile have been laid to rest. They required too much power, and were too expensive to manufacture. All types of mass storage media are being investigated; Apple does not appear to be sleeping.

## Lisa

Thursday was Lisa day. Lisa is the first in a family of personal computers to be

released by Apple based on the 68000 CPU. Developers are being encouraged to write software for Lisa and to take advantage of its powerful integrated software and ease of use for the end user. In this way the developer would have a head start on working with the new machines as they are introduced.

A prime example of the kind of software that has yet to be developed for Lisa is a spelling checker. Most of the material that was handed out at the conference was prepared using Lisa. It contained several spelling errors. It was one more reminder that the imperfect human remains in control, but the tools continue to improve.

An overriding theme of the conference was for developers to "leverage" their efforts with Apple by taking advantage of the research and development Apple has done regarding improved user interface and enhancements to programming languages. Ease of use is an important part of Apple's marketing thrust and was stressed repeatedly during several of the workshops at the conference. The Apple folks stressed their commitment to independent developers as being necessary to Apple's success.





NEW FOR  
VISICALC USERS ...

# DFX II

Use VisiCalc, Transfer Files, And Chat  
At The Same Time, All Via Modem!

DOS File Exchange II (DFX II) allows the user to transfer any standard Apple DOS 3.3 file via modem to another Apple II. Any type of file, Applesoft, Integer, binary, text and even relocatable binary files. But, DOS File Exchange II is not only an excellent file transfer program, it allows users to transfer files and chat at the same time. Yes, converse via modem while your files are being transferred. Sounds great, there's more. The most amazing feature of DFX II is its ability to let both users view the same VisiCalc worksheet and enter data or formulas in the sheet at the same time via modem. When the save command is issued, the file will be saved on both systems.

Just imagine working on a VisiCalc template simultaneously with someone at your home office; building a financial model, making changes, saving the file, seeing and discussing the results and revising

the template. Then clear the VisiCalc screen and simultaneously load another file and work on that file together. And, "Reflexive" VisiCalc is only the beginning. DFX II has other "Reflexive" modes as well, including Reflexive DOS, PIE Writer and others.

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Version  
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Software, Inc.

P.O. Box 19730-203  
Portland, OR 97219  
(503) 244-5782

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Attention IBM PC owners: Call us about backing up your protected software with Copy II PC!



# APPLESEED<sup>T.M.</sup>

## Apple Compatible Hardware for Dedicated Applications

**Design and program a system on a standard Apple computer and then market it with the low-cost APPLESEED system...**

Designed for use in systems where a full Apple computer may not be necessary or desired, the APPLESEED Bus system retains all the essential features of an Apple system, including mother board compatibility with almost every plug-in board available for the Apple II.

Programs are developed in assembly language on a standard Apple II. Upon completion, a set of EPROM's are blown and inserted into the APPLESEED Bus system, which then takes control of program execution.

You buy only what you need for your application; gone are the built-in keyboard, the consumer-oriented packaging and graphics subsystems. Cost, size and power consumption are substantially reduced while flexibility is greatly increased. Compatibility with a multitude of sophisticated programming and hardware add-ons, widely available for the Apple II, has been fully retained, providing a wide range of options for designing customized systems. (Applesoft<sup>®</sup> PROM's are not included.)

### **A sampling of APPLESEED Bus components:**

**CPU BOARD** The 6502 has been removed from the mother board and included in this card, which also contains the clock circuitry for the system.

**64K RAM BOARD** 64K of dynamic RAM with provision for control to be used in the normal Apple II conventions; deleting COOO-CFFF and software control over the DOOO-FFFF area.

**EPROM BOARD** Jumper selectable for 2716 (EPROM) or 34199 (PROM); blow 2716 assembly language programs and then run them in this EPROM board. Jumpers allow selection of software on/off, initialize on/off and other controls.

**UART BOARD** Software/hardware select all standard EIA baud rates. The board supports four 6850 UART's which allow four independent input and output EIA lines. Each UART is fully programmable for parity, bit length, baud rate, etc.

**UNIVERSAL BOARD** The APPLESEED Universal board contains the following: One 2716 socket for an F8 PROM, one 2K × 8 bit RAM (0-7FF), one UART channel for serial communications, 8 parallel INPUT lines (TTL), 8 parallel OUTPUT lines (TTL), device decode for one additional standard slot-dependent board, support for standard Apple II style keyboard, and a power supply connection. Each feature is independent and any combination may be used simultaneously. The Universal board is designed to be used with the APPLESEED CPU board.

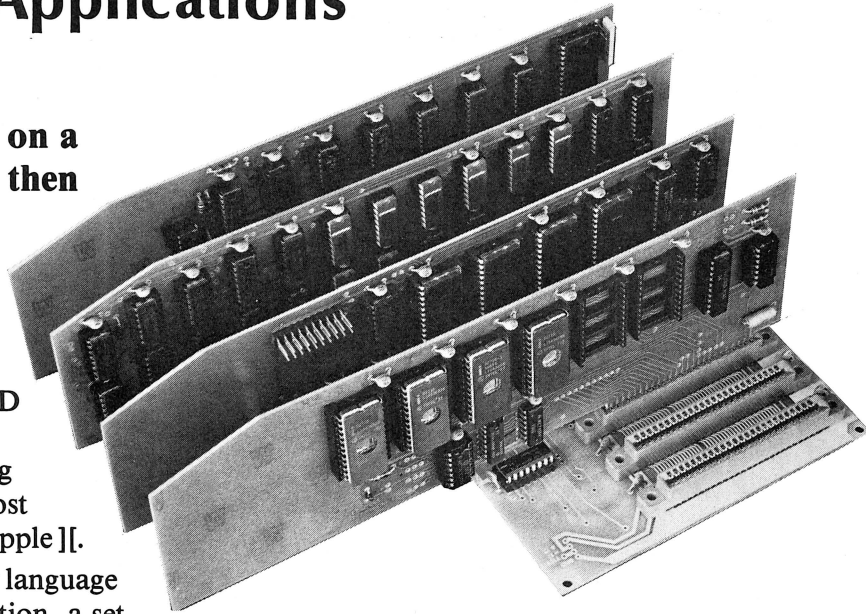
**TEXT BOARD** The TEXT board is designed to add the conventional TEXT (page 1 and page 2) to an APPLESEED system. The board generates composite video to plug into a standard monitor or T.V. modulator. The board provides 40 columns × 24 rows in each page and is not slot dependent.

**MOTHER BOARD** 10-slot motherboard is fully compatible with most Apple add-on cards currently available.

*Please call or write for prices and more detailed information on these and other APPLESEED Bus products.*

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①

How would you like to have the most powerful General Ledger system ever produced for the Apple II\* Plus and the IBM† PC? M&R's SUP' R LEDGER is just that . . . a system that up until now was available only for large computers.

②

How would you like a system that is so easy to use that in less than 4 hours you can have the system up-and-running? It's true! Thanks to our simple, concise user's guide the mystery of operation is quickly solved.

③

Is it possible to have all of this and still have a program that can accommodate 200 separate accounts, up to 1400 separate transactions in any given time period, and provide information on 10 separate cost centers? Yes! SUP' R LEDGER offers all of this and much more. Send for details.

## SUP' R LEDGER



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† IBM PC is a registered trademark of International Business Machines

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OFFERED FOR THE FIRST TIME PLEXA-LOK COMES WITH A 30-DAY MONEY BACK GUARANTEE IF NOT SATISFIED!

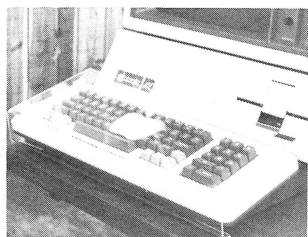
PLEXA-LOK slips up and over the keyboard – then gently snaps into position.

- Your valuable computer is protected from objects and spills directly on top of keyboard which could cost hundreds of dollars to repair!
- PLEXA-LOK allows your secretary to go on break without having to worry about visitors accidentally destroying their hours (and your \$) of work.

• **ENHANCES** looks of your system

• **PROTECTS** keyboard from dust

• **ALLOWS** computer to remain on while unattended



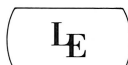
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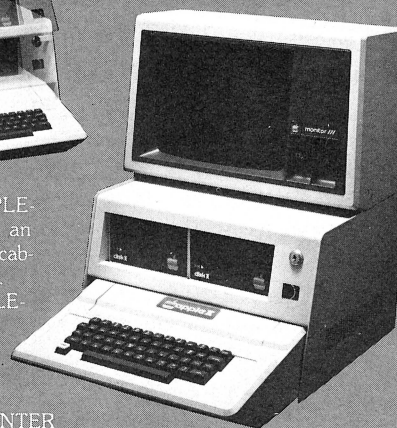
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## PROTECTING YOUR APPLE... AN OPEN AND SHUT CASE



Introducing the APPLE-CENTER Model 12, an opening and closing cabinet for the Apple II. Unlocked, the APPLE-CENTER opens up to allow you quick and easy access. Locked with the key, the APPLE-CENTER shuts tight to protect your Apple and 2 disk drives. The key also switches power to your Apple and your monitor. Both outlets are protected from damaging voltage surges with RKS Industries' SURGE SENTRY. We've even built in a filtered cooling fan. Direct order discounts.

## apple center

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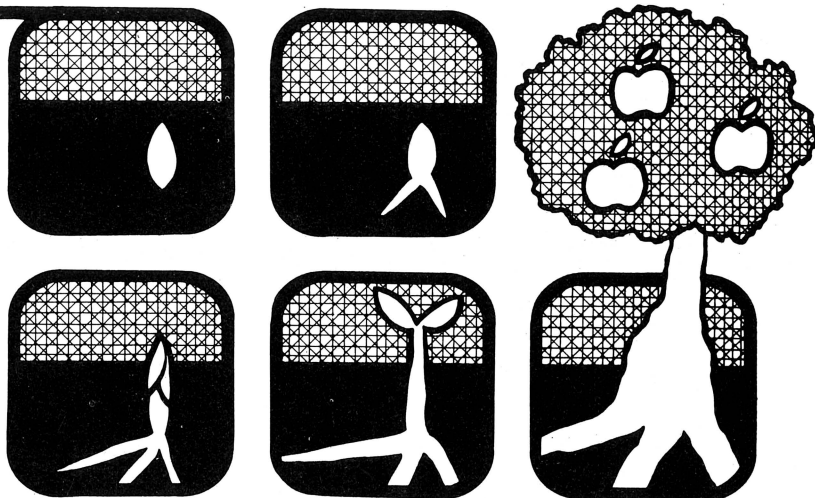
**DOSS INDUSTRIES**

**1224 Mariposa, San Francisco, CA 94107 (415) 861-2223**

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# Planting a seed...



## The Badmouthers

"Tell me; When is Apple gonna do anything right??"

We keep hearing it. (1) The Apple /// is a total disaster. (2) Lisa is a computer for which there is no real market; (who needs a \$10,000 work station?). (3) Macintosh will be eclipsed by the time it comes out. And (4) the Apple //e should have happened a year sooner. (5) Unifile and Duofile are trash. (6) Apple rejected VisiCalc. (7) Applewriter, Quickfile, and other Apple software products are not the products of choice in their areas. Garbage, compared to what's available on CP/M or the IBM PC. (8) And there's no new software for the Apple. "Everybody" in software development is developing for the PC first.

(9) Steve Jobs is a megalomaniac, a lightweight who got lucky. The good news is that (10) with him "playing" in Macintoshland he's out of the way and the grownups can run the company. (11) John ("The Fizz") Sculley was hired because "Camp Runamuck" was in trouble. (12) What can you say about a company where the artistic design group controls product marketing strategy? Or (13) where the decision process makes the most-asked question "How come I didn't know about this, when it's supposed to be my responsibility?" (15) "Apple people are devoted all right; haven't seen such dedication to a common purpose since Jonestown."

(15) Apple doesn't support its dealers. (16) Apple doesn't screen its dealers, or train them. (17) Look at the large store chain that told Apple to visit a good taxidermist. (18) Apple doesn't support its customers, either; there used to be a hotline, but that stopped. They (19) killed mail-order to fatten profits. And service (20) ranges from nonexistent to just bad. In short, (21) Apple is a company that has already seen its best days.

That's just a sample; the computer press is full of this kind of incendiary editorial driftwood, just as other segments of the

press, radio, and TV are in hot pursuit of circulation through sensation and the broadcast of colorful negative innuendo and opinion. Well, sensation and attack may sell papers, but they don't satisfy the need for solid and helpful information.

Here's the reason why **Apple Orchard** has existed without an "industry gossip" column: we have felt that most of the people who own Apple computers don't know about the politics of Apple, and care even less. The magazine's primary function is to help people do more with their computers; the Silicon Valley Soap Opera doesn't really contribute to that goal. We devote the space to new product coverage, which does help you.

As to the good and bad decisions, sure, we'll call 'em the way we see 'em; our loyalty as an independent publication is to you, the Apple user. But our responsibility is to present what facts there are, good or bad for a commercial interest, *when the facts and context can be verified, and when it helps you*. Frankly, we don't think you're well-served by the magpie cries of the gossipy sensationalists as they seek to feather their own nests.

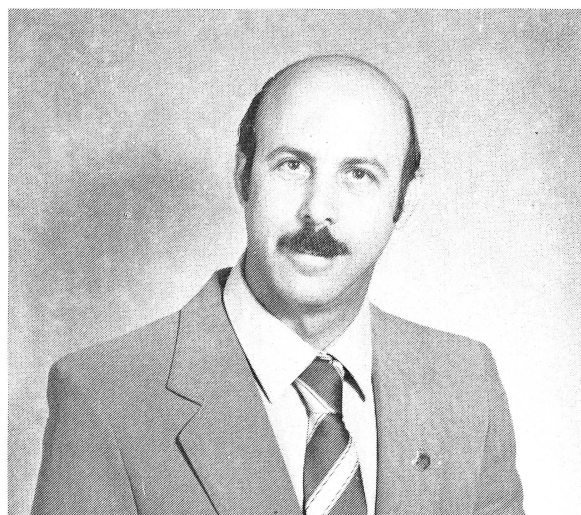
One more thing: if even a significant part of the bilge water referenced above were either true or relevant, would Apple ever have attained Fortune 500 size in five years?

*Rollig*



# From the IAC Office...

Ken Silverman, Executive Director



There still seems to be a gross misconception about user groups and software piracy. A number of software vendors, authors, and retail stores perceive that most user groups are nothing more than a place where commercial software is copied. This perception is totally false.

User Groups demonstrate commercial software, write reviews, and comment on the pros and cons. They are a resource center

for prospective buyers, a place where you can get an honest answer from people who are using or have tried a specific program. This also applies to hardware; "what should I purchase in a printer" is a good example. A User Group is formed to help, educate, and inform - software copying is not part of that.

The IAC, since its inception in 1979, has stood against the copying of any commercial/copyrighted software. It is even one of the two conditions under which a member user group can be terminated from the IAC. In the past 4 years, we have issued warnings, which were complied with. The IAC has not had to terminate a group for this offense - that's quite a record for a user group membership of over 450.

This entire subject is regrettable and in the long run takes its toll in the form of higher prices and "protected", harder to copy, software for everyone. Manufacturers generally accept that copying is inevitable, and accordingly market their products at a higher price to recoup their costs before they lose money to copies.

The so-called "copy protected disk" can be copied by someone with sufficient skill and expertise. But for the most part, this added difficulty reduces the number of copies that could be made. The "copy protected" program can be a burden on the legitimate purchaser in the form of delays, when a replacement is needed, and in some cases, of additional charges, when trying to obtain a backup.

There have been many forums presented on this subject at computer shows. Many plans have been proposed to prevent copying while supplying the purchaser with ways or means of a backup so he always has access to his software. Each author or manufacturer has their own scheme. Again, this is regrettable, but it is something brought upon ourselves by knowingly accepting and using, from whatever sources, bootlegged programs.

## Available from the IAC:

### Apple /// Software

#### Apple-CON (verter)

from Apple Computer, Inc.

Converts Applesoft programs to

Business BASIC .....	\$ 10.00
RS232 Drive, slot selectable .....	10.00 ✓
DOS to SOS Converter .....	10.00
File Cabinet /// .....	10.00
CP/M —} SOSText Mover .....	25.00
BASIC Compare /// .....	25.00

### Apple II Software

Pascal Attach-BIOS disk .....	\$ 8.00
Hi-Res Games (9 on disk) .....	8.00
Applesoft Tutorial .....	8.00
Machine Language Tutorial .....	8.00
Pinball Games .....	8.00
Educational Disk .....	8.00
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• California residents add 6½% sales tax.

• Any orders to be shipped outside of the U.S., Canada, or Mexico must include additional shipping costs of \$2.50 per disk and \$3.50 per back issue ordered.

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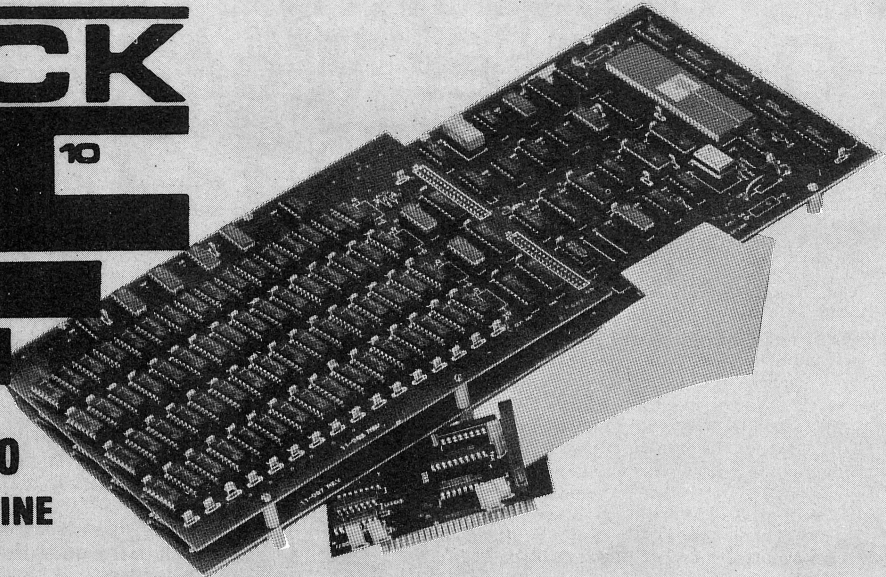
International Apple Core  
908 George Street  
Santa Clara, CA 95050



# DTACK

10

## The 68000 DREAM MACHINE



### THE DTACK GRANDE:

Above is a photograph of the prototype for the DRAM version of our Apple compatible 68000 board. We have modestly named it the DTACK Grande because it has a **Grand(e)** amount of memory: a megabyte! That's called a *full gallon* here in California. (You can buy one with only 128K if you like.) This one has a 25MHz Xtal oscillator which we divide by two to generate the 12.5MHz clock for the 68000. DTACK is **not** grounded; there is one wait state. Refresh is performed in software, with a hardware assist so that the overhead is exactly the same for a megabyte as for 128K (4%). Thus the effective speed of this board is equivalent to 10MHz with no wait states.

Which makes our one megabyte 68000 exactly twice as fast as **another** one megabyte 68000 system that you Apple types may have heard of. The other one doesn't work with Apple II's, of course. Ours does.

Because the refresh is interrupt-driven, this board is inherently capable of multi-tasking so all you print spooler and type-ahead buffer fans should *love* this board. We think it will make a **dandy** RAMDISK. Oh, yes: it has a big, fast 68000 microprocessor (we almost forgot while we were admiring all that memory!).

### TRUTH IN ADVERTISING:

Many of you have seen that ad with the tricycle falling apart which asserts that the iAPX 286 is faster than the 68000. Here are the facts:

- 1) The board pictured above, with one wait state, can perform a 32 bit add in **less than half a microsecond** and an 8MHz 286 *can't*.
- 2) Intel is currently running ads offering 6MHz 286 boards, projecting delivery of 7.7MHz boards early next year. **What 8MHz 286?**
- 3) The 68000 has exactly seventeen more 32-bit registers than the 286. That's because the 286 doesn't have any.
- 4) Back to that tricycle ad: have you noticed the fine print that says the speed of the 68000 has been "**adjusted**"?
- 5) AMD and Intel like to compare against a slow 8MHz 68000, burdened down with a memory management chip for **multi-user** systems. We are offering 12.5MHz 68000s for **single-user** applications. BIG difference!

- 6) The 68000 can **linearly** and **directly** address up to 16 megabytes of RAM. The 286 **can't**. That's important when you have a megabyte of RAM!

However, since we believe in 'truth in advertising' ourselves, that prototype pictured above doesn't work yet. We have not yet programmed the PAL memory decode chips or the bootstrap PROMs. This ad is being written on 23 May '83, so things may have changed by the time you read this.

### THE 'STUFFER' BOARD:

In our last ad we told you about a 'block DMA' interface we were developing. The production boards just walked in the door and we will be shipping that interface this month. It works with both the static and the dynamic RAM 68000 boards we make. (However, it was designed before the Apple IIe was available, so it is **not** compatible with the IIe.)

### SOFTWARE:

All the stuff we mentioned in our previous ads is still available. We are well along the road developing HALGOL, a high speed BASIC-like language that runs at close to 68000 assembly language speeds - and that is **very** fast! Right now we are finishing up the BIOS. That stands for Basic I/O System. It turns the 6502 in the Apple into an I/O handler exclusively, and lets the 68000 take over and run things.

### SHOULD YOU BUY OUR BOARD?

Our board is still not suitable for persons who just want to turn on their computer and run canned software. You **must** have some interest in doing some programming yourself, or you will not want to buy one of our boards.

We still provide **lots** of 68000 source code on unlocked, easily copyable disks. Three disks with demo programs and source code are shipped with each board.

Aside from that, we can only think of a **million reasons** why you might like to buy one of the boards pictured above.

**DIGITAL ACOUSTICS**  
1415 E. McFadden, Ste. F  
Santa Ana, CA 92705  
(714) 835-4884



# One User Wonders What Happened to USER 1 on the //e

*by Dan Fischer*

Hidden away on the old Apple II motherboard was a pair of solder pads affectionately referred to as "the USER 1 Jumper." They were not flagged on the silk screen but they were pictured in the Apple II Reference Manual (Page 99, if you doubt me).

"If you connect a wire between these two pads, then the USER 1 line on each peripheral connector becomes active. If any peripheral card pulls this line low, ALL internal I/O decoding is disabled. The I/O SELECT\* and the DEVICE SELECT\* lines all go high and will remain high while USER 1 is low, regardless of the address on the address bus."

The USER 1 line was connected to pin 39 of each of the I/O slots if you installed the jumper. (I don't know of anyone who did.) The other end of the line was held high by a pullup resistor. It served as a chip enable for the 74LS138 at chip location H12 (pin 6). (Chip locations are referenced by a combination of letter and number, just like the grid squares on a road map.) Although I know of no one who installed this jumper, I do know of two card manufacturers who use USER 1.

The Mountain Computer CPS Multifunction Card includes a jumper that runs from the card to a little socket that snuggles under the 74LS138 at H12. The jumper accesses the USER 1 line without benefit of Apple's "USER 1 jumper." By pulling this line low the CPS card can "phantom" its functions over other cards.

The other card that uses USER 1 is Prometheus Products' Versacard. The card also phantoms functions over slots where it does not reside. But the Prometheus card doesn't do it by pulling USER 1 low. The VERSACARD presumes a user is smart enough not to try to put two incompatible functions in the same slot. VERSACARD generates its own I/O SELECT\* and DEVICE SELECT\* for the slots where it is phantomed. And it recognizes the function of USER 1 and responds to it. If USER 1 goes low the VERSACARD does not generate its I/O SELECT\* and DEVICE SELECT\* signals.

So along comes the Apple //e. It needs to improve on the Apple II. (Hey, what's progress for, if not improvement?) There was only one pin on the Apple II bus that wasn't used and Apple wanted to add two more signals. One of the new signals is ENKBD\*. It is normally low and enables the normal keyboard. A peripheral board may lockout the keyboard by pulling this signal high. The other new signal is UPSYNC which is high during operation code fetch. It is a signal directly derived from the 6502. Used in conjunction with RDY a board could single step the 6502. Unfortunately, however, UPSYNC replaces the old USER 1.

Well there goes the old compatibility. USER 1 just doesn't exist in the //e. The VERSACARD is in trouble because it disappears every op code fetch. (Easy fix, just cut the trace to pin 39.) But it may not be so easy for the CPS card. (Or maybe it's easier.) There being no USER 1 line any more, the CPS card could just ignore it, not attempt to disable I/O decoding. It just might work, . . . BUT!

Have you noticed that there are two 8K ROMs in the //e where there used to be six 2K ROMs in the Apple II? In the Apple II, the resident BASIC and the MONITOR occupied the addresses from \$D000 to \$FFFF, 12K of addresses, (6 \* 2K = 12K). Have you wondered about what the extra 4K might be used for in the Apple //e? Have you wondered how to address it? Well so have I, but that is beyond the scope of this article.

Suffice it to say that some of the extra 4K of ROM is phantomed over the I/O SELECT\* areas. Any board that directly decodes these addresses may get into serious trouble when the MONITOR uses them. It is no longer so simple as to just decode the addresses.

"SON OF USER 1" to the rescue! Remember pin 6 on the 74LS138 at H12? You know, USER 1. Well, it's been replaced by a new signal called CXXX. CXXX is generated by the //e's Memory Management Unit (MMU). It is high whenever the address bus is addressing addresses between \$C000 and

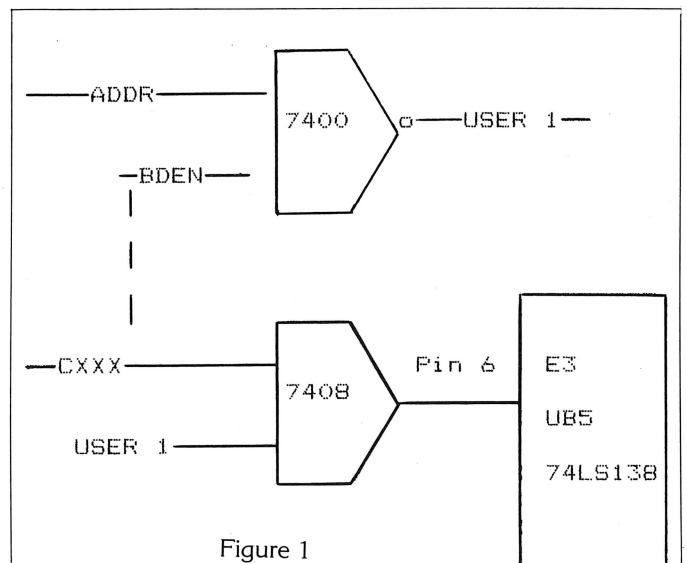


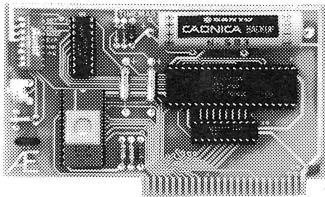
Figure 1



# APPLIED ENGINEERING

## THE BEST PERIPHERALS FOR THE BEST COMPUTER

### The TIMEMASTER Finally a clock that does it ALL!



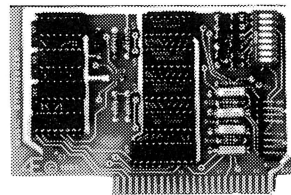
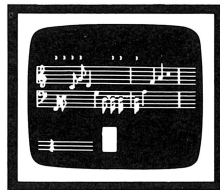
- Designed in 1983 using I.C. technologies that simply did not exist when most other Apple clocks were designed.
- Just plug it in and your programs can read the year, month, date, day, and time to 1 millisecond! The only clock with both year and ms.
- Powerful 2K ROM driver — No clock could be easier to use.
- Full emulation of most other clocks, including Mountain Hardware's Appleclock (but you'll like the TIMEMASTER mode better).
- Basic, Machine Code, CP/M and Pascal software on 2 disks!
- Eight software controlled interrupts so you can execute two programs at the same time. (Many examples are included)
- On board timer lets you time any interval up to 48 days long down to the nearest millisecond.

The TIMEMASTER includes 2 disks with some really fantastic time oriented programs (over 25) plus a DOS dater so it will automatically add the date when disk files are created or modified. This disk is over a \$200.00 value alone — we give the software others sell. All software packages for business, data base management and communications are made to read the TIMEMASTER.

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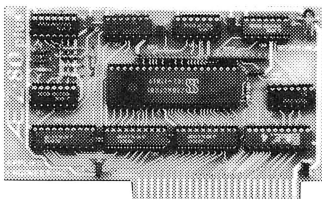
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VIEWMASTER	169	YES	YES	YES	YES	YES	YES	YES
SUP'RTERM	375	NO	YES	NO	NO	NO	YES	YES
WIZARD80	245	NO	NO	YES	YES	NO	YES	YES
VISION80	375	YES	YES	YES	YES	NO	NO	NO
OMNIVISION	295	NO	YES	NO	NO	NO	YES	YES
VIEWMAX80	219	YES	YES	YES	YES	NO	NO	YES
SMARTERM	360	YES	YES	YES	NO	NO	YES	NO
VIDEOTERM	345	NO	NO	NO	YES	YES	NO	YES

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\$CFFF AND when the MONITOR's CX Space is off. This signal allows I/O decoding just as USER 1 inhibited it. The //e has a 74LS138 located at B5. It functions almost identically to the 74LS138 (the "138" to its friends) on the II Plus.

Cards like the VERSACARD which used to read USER 1 can use a jumper to B5 pin 6 to read CXXX. Cards like the CPS card which used to pull USER 1 low have a slightly harder time of it. They must put some logic between CXXX and the 138 that will disable their own address decoding and pull pin 6 of the 138 low when CXXX goes low. Their logic must not attempt to pull CXXX low when they wish to inhibit I/O decoding.

As long as the 74LS138 at B5 is socketed it won't be too hard to add a small circuit, such as the one pictured in Figure 1 to mimic the functions of USER 1. May the FORCE be with us if Apple ever decides to eliminate the socket under the 138.

To implement the above circuit, the 74LS138 at B5 would have to be removed and inserted in a small circuit that would break the CXXX line and provide a jumper to the peripheral board needing the functions of USER 1. The new board would contain the 7400 and the 7408 chips diagrammed in Figure 1. CXXX high and a high from the board's address decoding would pull low the USER 1 signal. This could be used by the board to enable its chips and outputs. It would be ANDed with CXXX and fed back thru the jumper to disable Apple //e on-board I/O decoding. Using this circuit I/O decoding would be inhibited either when CXXX went low or when CXXX was high and the peripheral board had decoded an address in its area.

It sure is nice to know that some problems remain to be solved, isn't it?

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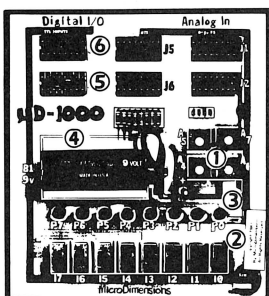
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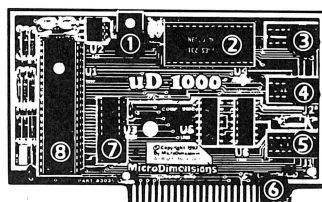
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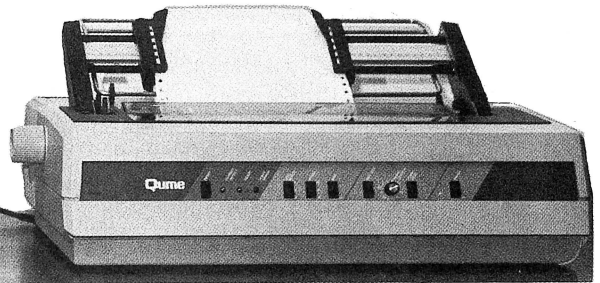
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# Installing an Apple /// Driver or What Have I Gotten Myself Into?

*by Mike Kramer*

*Houston Area Apple Users Group*

## THE INITIAL SHOCK

When my office Apple /// arrived a little over a year ago, everyone was anxious to see what it could do. This naturally included seeing it *print* something. After impressing everyone with being able to enter a simple VisiCalc spreadsheet without reading the manual, I lost all credibility when it wouldn't print anything on the Epson printer. After they left, I got out the owner's manual and discovered that Apple /// software normally comes configured for serial printers connected to the built-in serial port. For me to print on the Epson printer connected to the Universal Parallel Interface Card (commonly called a UPIC) in Slot 1, I needed to install and configure a parallel driver. What's more, I needed to do this with every boot disk I had or would ever have, that would use the parallel card.

What I didn't realize at that point was that the source of my "difficulty" was in fact one of the outstanding features of the Apple ///. That feature is Apple ///'s ability to execute programs written with little regard to what kind of output device would be used (also known as *device-independent I/O*). Without the programmer knowing ahead of time where program output will go, output from Apple /// programs can be directed to a printer, the screen, a named disk file, etc., at run time.

The price we pay is having to generate appropriately configured drivers into any new software we get. Not much of a price when you know how, and you should know how to install drivers if you intend to use an Apple ///. This is particularly so since generating drivers for the Apple /// is not something the typical store person knows very much about (there are exceptions, however). So after this rambling introduction, get out your Standard Device Drivers Manual and, if you have one, the UPIC Parallel Interface Installation and Operating Manual, and let's find out how to do it.

## What is a Driver?

First, let's review what a driver does. The Standard Device Drivers Manual describes peripheral devices such as the keyboard, video display, speaker, and input/output (I/O) ports as the "senses" of the computer, i.e., the eyes, ears, etc. These senses are connected to the Sophisticated Operating System (SOS) by device drivers which perform four functions:

- Process data generated by programs and send it to the devices as output.
- Process data generated by the device and send it to programs as input.
- Permit programs and SOS to control the device and the driver itself.

- Permit programs and SOS to read the status of the device and the driver.

Most of you don't need to be concerned with the specifics of what the drivers do, but it should help your understanding if you're generally aware of what they do and why they are there.

## System Configuration Program

One of the disks provided with the Apple /// is the System Utilities Disk, which includes the System Configuration Program (SCP). This is the tool for adding or removing device drivers, or changing the parameters that control their operation. You may have noticed when cataloging disks that every bootable disk has three special files named SOS.KERNEL, SOS.DRIVER, and SOS.INTERP. SOS.KERNEL is SOS itself. SOS.INTERP is the machine language "interpreter" which runs on bootup. This can be Business BASIC, Pascal, Apple Writer ///, VisiCalc, etc. Unless you become very, very good with the Apple /// you will never create your own SOS.INTERP.

SOS.DRIVER contains the system configuration, including the drivers and their control parameters, the number of disk drives connected, the video display character set, the ASCII character codes assigned to each key on the keyboard, and the slot assignments for any interface cards plugged into the connectors inside the Apple.

## Reading a Driver File

First, let's find out which drivers are in fact currently on a boot disk. Place your System Utilities diskette in the built-in drive and boot it. Next, run the SCP by moving the cursor to the third line and pressing RETURN. To look at and possibly change any of the information defining how your Apple /// operates, tell the SCP to READ in the SOS.DRIVER file from the diskette of interest by placing the cursor over "Read a Driver File" and pressing RETURN.

Why not read in the SOS.DRIVER file from the Utilities diskette itself and configure it (you *are* using a backup copy of the original disk, aren't you?), so that you can list directories on your printer rather than always listing on the screen. The SCP defaults to .D1/SOS.DRIVER, so all you have to do is press RETURN. To read from a disk in the external drive, change .D1 to .D2 before pressing RETURN.

After a few seconds, the current driver configuration will be displayed on the screen as shown on Page 12 of the Standard Device Drivers Manual. Note that each driver has a unique name beginning with a dot (looks suspiciously like a period). A driver can have any name as long as it begins with a dot



(period) followed by a letter, is not more than 15 characters long, and contains *only* letters, numbers, and periods. Also note that an asterisk in front of a driver name means that driver is included in the driver file but is inactive. When flagged as inactive, that driver is not loaded into memory on bootup and cannot be accessed during program execution. The benefit of doing this is that you don't use up memory with drivers you are not currently using.

When you have finished reading the driver names press ESC to return to the SCP menu.

### Editing Driver Parameters

Next select the "Edit Driver Parameters" option on the SCP menu. The driver file you read into memory earlier probably had a driver named **.PRINTER**. On a new boot disk, this is most likely a serial driver. You can find out what it is by moving the cursor to highlight **.PRINTER** and pressing «RETURN». You will then see a display which lists the device name, the type, the subtype, the activity status, comments, and driver configuration block information. At this point you are interested in whether the device is serial or not. You can usually assume **.PRINTER** is serial if the slot is indicated as "n/a", which indicates **.PRINTER** has been assigned to the built-in port. Unfortunately, few people bother to use the comments line to document in English how the drivers were configured.

If you are installing a parallel driver, you will probably name it **.PRINTER**, since this is generally accepted as the name of the most commonly used driver. Rather than delete the serial driver from the disk, give it another name such as **.SPRINTER** and deactivate it. You may want to use it later when you get your serial letter quality printer. While you're at it, use the comments line to indicate that this is a serial driver.

### Adding a Driver File

Assuming you're adding a parallel driver, insert the disk included with the UPIC card in one of the drives (we'll assume Drive 2). Press «ESC» twice to exit the Edit Driver Parameters display and return to the SCP menu. Once again select the "Read a Driver File" option. This time, when asked for the pathname of the driver file, type **".D2/PRINTER.DRIVER"**. This will cause the parallel printer driver file to be read from the UPIC disk. Note that **PARALLEL.DRIVER** on the UPIC disk is intended for communication between computers using a parallel interface and should not be used here. Note that the new driver's name has been added to the end of the list of drivers and that you may have two drivers with the same name. Press «ESC» to return to the SCP menu.

### Configuring the New Driver

The next step in this adventure is to configure the parallel driver for your particular printer and tell SOS in which slot your parallel interface card has been installed. To configure the driver, once again select "Edit Driver Parameters". The driver name will be **.PRINTER**, so you will probably have no need to change it. It will also be active. You should make an entry in the comments line to indicate what printer you are using.

Now for the hard part: tailoring the values in the Configuration Block for your printer. The Configuration Block can contain up to 255 values arranged in up to 16 rows of 16 values (the last row has 15). These values are used with serial drivers to specify baud rates, with the Silentyte to control heating of the dots in the print head, etc. With the parallel driver, five values are used to tell the driver (1) what control signals in the cable are to be monitored, (2) what the normal values are, (3) whether the printer generates its own line feeds, (4) the polarity of the printer handshake signals, and (5) the printer response

timeout. To find out what these values should be for your printer, look on Page 19 of the UPIC manual. Enter these values into the Configuration Block. If you do not see your printer listed, try using **"00 00 00 00 0A"**. Press «ESC» to return to the parameter list. When you are satisfied that they are all correct press «ESC» to return to the SCP menu.

### Changing System Parameters

All that remains is to tell the system where the parallel card is installed. This is done by selecting the "Change System Parameters" option. You will be shown a list of the current system parameters. Select the "Peripheral Slot Assignment" option to list the slot assignments. Most assignments will say "n/a", indicating built-in slots. To change a slot assignment, enter the number of the driver as shown on the display. When you are asked for the slot assignment, type it in. If you are unsure of the slot assignment, look at the openings in the back of the Apple and see which one has a filler plate labelled "Universal Parallel Printer Interface". From the rear, Slot 1 is on the left.

Note that it's possible to have two or more drivers assigned to the same slot. This would be done, for example, if you wanted to use both a dot matrix printer as a draft printer and a letter quality printer from the same program using the same interface and a switch box.

Press «ESC» to return to the listing of the Current System Parameters. Press «ESC» to return to the SCP menu.

### Generating a New System

The final step is to generate a new system that incorporates the new configuration information and install it on the disk. Select "Generate New System". There are two functions performed in system generation, validation of the configuration and storing of the new configuration on the disk. When validation is successfully completed, you will be asked for the name of the file where the new configuration is to be saved. You do not have to name the file **SOS.DRIVER** at this point. In fact, you can create a disk containing nothing but system configurations for different applications and transfer these to your boot disks as needed. They do have to be named **SOS.DRIVER** to be loaded on bootup and used.

If you decide to store the driver file on your disk under the name **SOS.DRIVER** and a file exists under that name, the SCP will ask if you want to replace it. If you answer yes, the old **SOS.DRIVER** will be lost. You might want to name it **NEW.DRIVER** at this point and preserve the original **SOS.DRIVER** file. When System Generation is complete, select the "Quit" option. If you have not performed a new system generation, a warning will be given and you will have to indicate that this is in fact what you want to do.

If you preserved the original **SOS.DRIVER** but want to try the new configuration, enter the Filer section of the Systems Utility and rename **SOS.DRIVER** something like **OLD.DRIVER**. Then change the name of **NEW.DRIVER** to **SOS.DRIVER**. If all went well, you should be able to print on your parallel printer when you reboot using the modified boot disk. If the printer doesn't work, start over and pay close attention to which parallel driver is read in, what slot is specified, and what Configuration Block information is entered. If the printer prints, but does strange things, the Configuration Block is likely to be the problem.

So there you have it. No longer will you wonder why your printer does either weird things or nothing at all when you tell it to print, and you'll enjoy the flexibility of configuring drivers for anything and everything.





# Changing an Apple /// CP/M Driver File

*by Mike Kramer*

*Houston Area Apple Users Group*

**A**lthough the procedure to add, change, or delete a driver under Apple /// CP/M is similar to that under SOS, it requires more steps and the steps required are not intuitively obvious. This discussion attempts to summarize those steps, but is not intended as a substitute for the manuals.

Because of constraints in the CP/M system, the peripheral driver file is named **DRIVER.SOS** rather than **SOS.DRIVER**. As supplied by Apple, the CP/M system knows about the console, Silentype, and serial drivers. It is totally ignorant of parallel devices. Your task is further complicated by the fact that CP/M only knows about four physical devices, consoles (CON:), tape readers (RDR:), tape punches (PUN:), and system printers (LST:). It permits up to four logical devices per physical device. Your driver file, however, can have as many drivers as you want within memory constraints. You just can't access all of them easily. A further complication is that apparently you can't look at the contents of the driver configuration blocks once the driver file is placed on the CP/M disk. You can see what drivers are included and which are assigned to the CP/M logical devices.

## Preparing the Driver File

The first step in adding to or changing the CP/M **DRIVER.SOS** file is to boot the Apple /// SOS Utilities Disk. Since the procedure for preparing a driver file is well documented in Chapter 2 of the Standard Device Drivers Manual it will not be discussed here. The main point to remember is that you start the procedure under SOS, not CP/M. Further, you should store the driver file on the CP/M Utilities Diskette under the name **DRIVER.SOS**. If you name it **SOS.DRIVER** you would overwrite the **SOS.DRIVER** file on the utilities diskette, which you may not want to do.

## Transferring Driver from SOS to CP/M

Insert the CP/M System diskette in the built-in drive (Drive A:); insert the CP/M Utilities Diskette in the external drive (Drive B:) and boot the system. Next type "**SOSXFER**" to run the SOS-to-CP/M file translation program. After an asterisk appears, type the following:

```
B: DRIVER.SOS = A: SOS.DRIVER
```

If you do not want to change the driver file on the CP/M System diskette, you will need to specify a different destination name on the left side of the "=" which would have to be used through the rest of the procedure described below.

After you specify the source and destination files and press RETURN the screen will then display:

```
Insert SOS disk into drive A:
Insert CP/M disk into drive B:
Press RETURN to begin
```

When the transfer is complete, the message "Transfer complete" will be displayed.

For more detail on the use of **SOSXFER**, see Page 74 of the Softcard /// Installation and Operation Manual.

## Configuring CP/M I/O

Replace the SOS disk in Drive A: with the CP/M System Diskette, press Control-C to do a warm start, and run the configuration program by typing "**CONFIG**". **CONFIG** will list the names of all the drivers in the **DRIVER.SOS** file, along with the current CP/M device assignments. Likely the device assignments will show that CON:=CO1 and that CO1:=.CONSOLE. Also, it will probably show that LST:=LS1 and that LS1:=.PRINTER. If you named the parallel driver .PRINTER then you are all set. If you wanted a Silentype to be the system printer and it is listed as LS2: you would just type LST:=LS2:. When the device assignments are as you want them, type **END** or a Control-C. You will then be asked if the changes should be made permanent. If you answer "YES", they will be written back to the built-in drive.

See Page 52 of the Softcard /// Installation and Operation Manual for a sample display and detailed explanation of the use of the **CONFIG** utility.

## Transferring DRIVER.SOS to Other Disks

Place any diskette on which you wish to have the new **DRIVER.SOS** file placed into the external drive (B:). Leave the CP/M System disk containing the new **DRIVER.SOS** in the built-in drive (A:). Press Control-C to tell CP/M a disk was changed. If you don't, you will get an error when you try to write to it. Next erase the **DRIVER.SOS** file on the disk in the external drive with the following command:

```
>ERA B: DRIVER.SOS
```

Next, transfer the new **DRIVER.SOS** from the CP/M System disk with the following command:

```
>PIP B: DRIVER.SOS=DRIVER.SOS
```

When this operation is complete, you should have a disk with the desired I/O configuration, assuming that you did everything correctly. If you want the same I/O configuration on another disk, just PIP it.







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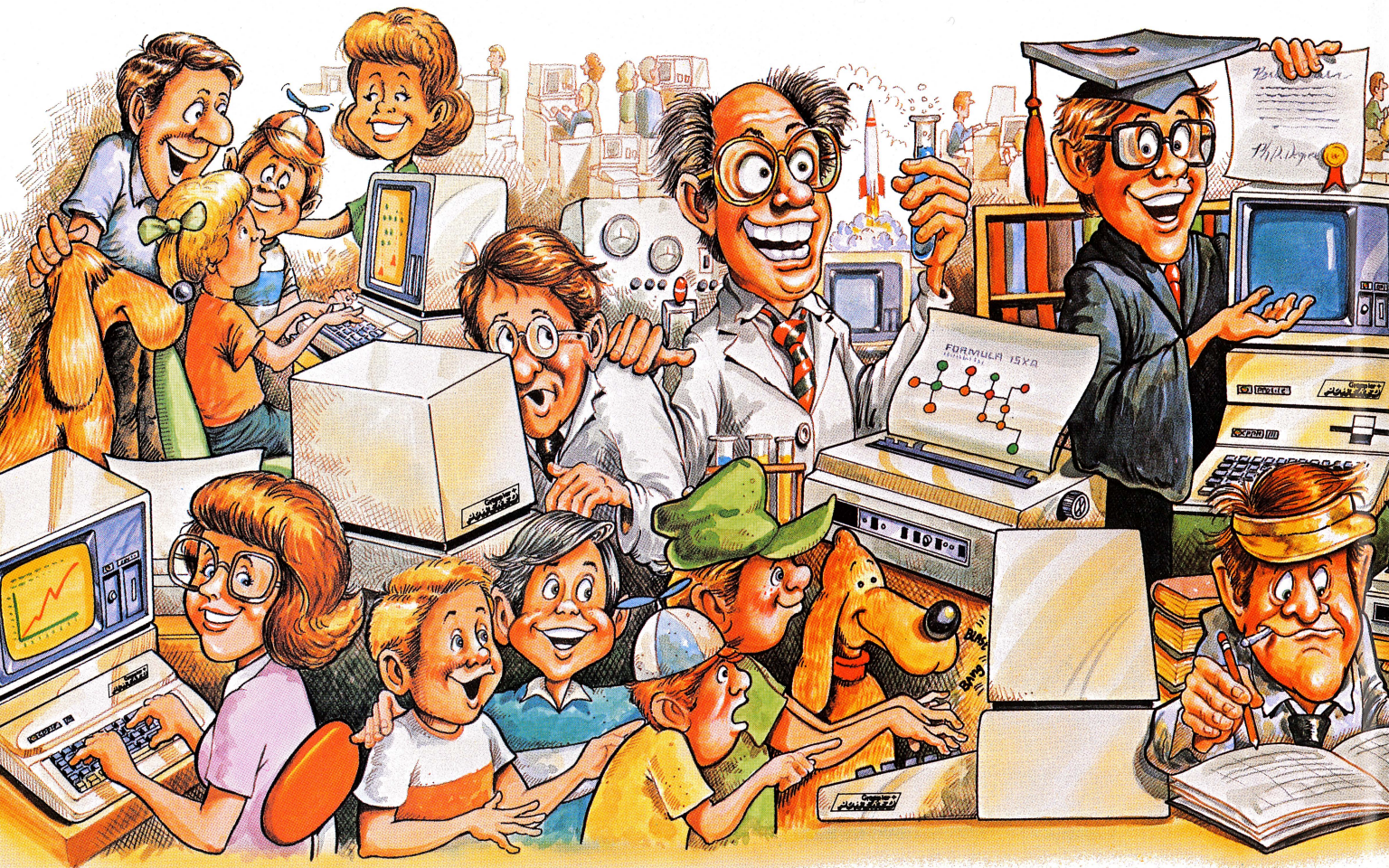
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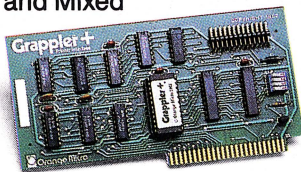


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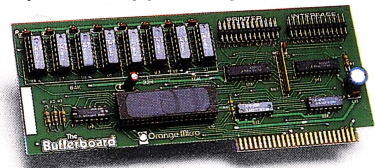
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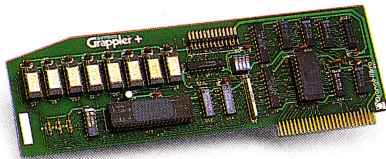


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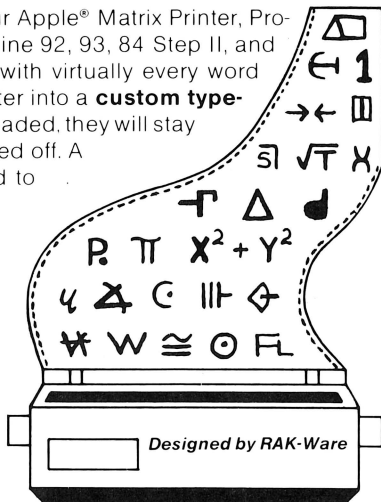
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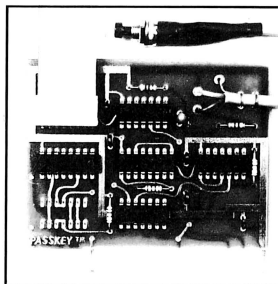
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# The Speediest Apple

*Review by Neil D. Lipson, P.E.*

**T**his article will be the first part of a series on how to speed up your Apple II Plus or Franklin Ace 1000. I did not try these techniques on the //e, but most of them should work as well. The following items will be covered:

1. Ramex 128K card by Omega Microware
2. Microseeds Fastload
3. Diversi-Dos
4. Synetix SSD Disk Emulator
5. David-Dos
6. Saturn Accelerator II
7. Routine Machine by Southwestern Data Systems
8. Arithmetic Processor by California Computer Systems

All of these products have a speed-improving impact on your Apple; one or more of the processes will execute more rapidly than on a standard machine. What I wondered was, what would happen if more than one of these devices were used at the same time? Let me tell you that the results are spectacular! First, let's look at some general results; then we'll go into many techniques and describe in detail exactly what I did, and how you can accomplish the same results.

## High Speed DOS

In my previous article, *Speeding Up DOS* (Apple Orchard, November-December, 1982), we covered some methods for fast disk access. Here's how to go one step further. I used the Saturn Accelerator II with the normal preboot supplied with the program. I then inserted the Synetix SSD disk and ran the disk emulation program. Some Hi-Res pictures were then loaded into the emulator. Once this was done, I used either Diversi-Dos or Fastload from Microseeds in the patch mode to "patch" the DOS to make it faster. For the most part, DOS then ran instantly. I could load Hi-Res pictures that normally took 10 seconds per picture in about 1/10 of a second, or 10 frames a second. This is twice as fast as without the Accelerator II.

The same thing, using the Ramex 128 card instead of the Synetix SSD, gives about the same results, with the proper patch to the operating system. The Ramex 128 can, of course, also be used for high speed VisiCalc as well as generally extending memory. I used a custom patch, but understand that many of the fast DOS people are developing their own patches. In addition, the Saturn software worked well on the Ramex card. The card is quite versatile.

## High Speed Applesoft and 6502 Operation

I then tried the following combination: the Accelerator II, the CCS Arithmetic Processor and some programming tricks. Applesoft ran up to 250 times faster. The Accelerator II made everything in the 6502 mode run faster, including games. Did you ever try to play Choplifter at a three-times-faster speed?

One of the slowest things to do on a computer is sorting. Even with the high speed sort programs, it still takes a while. Well, those days are over. I tried the Routine Machine sorting routines with the above hardware. The sorting routines are only a small part of Routine Machine, which we'll discuss in more detail later.

With the Routine Machine, and the Accelerator, sorts that normally took 5 minutes with my old Applesoft routines were done in about 6 seconds. Routine Machine has small machine language programs that append onto the main Applesoft program, and you use them accordingly. The package is amazing, and this is just one of many of their packages which we'll cover in future issues.

One aspect of Applesoft and DOS that drives everyone crazy is slow loading and saving of text files. There are numerous ways to speed them up. If you have a random access file, use Diversi-DOS. In quoting from their manual, Diversi-DOS contains an optional faster way to specify the record and byte parameters when reading or writing a random access text file from Applesoft BASIC. CALL 1005 sets these parameters to the values in the Applesoft variables name "RE" and "BY" respectively. The following example will illustrate how to use this feature:

Standard DOS way:

```
10 PRINT CHR$(4);"OPEN RANFILE, L500"
20 BY = 0
30 FOR RE = 0 TO 100
40 PRINT CHR$(4);"WRITE RANFILE,R";RE;" ,B";BY
50 PRINT "TEST DATA"
60 NEXT
70 PRINT CHR$(4);"CLOSE RANFILE"
```

Diversi-DOS way:

```
10 PRINT CHR$(4);"OPEN RANFILE, L500"
```



```

20 BY = 0
30 PRINT CHR$(4);"WRITE RANFILE"
40 FOR RE = 0 TO 100
50 CALL 1005
60 PRINT "TEST DATA"
70 NEXT
80 PRINT CHR$(4);"CLOSE RANFILE"

```

The CALL 1005 is over 60 msec faster than the standard DOS PRINT command, which amounts to about a 2 to 4 times speed decrease.

The counterpart to Diversi-DOS is David-DOS. David-DOS, though, speeds up sequential text file loading instead of random access text files. Therefore, you choose the DOS that fits your needs. To accomplish this, use the TLOAD command. TLOAD speed loads a random or sequential text file starting at \$1000 or any address you choose with the "A" parameter. If you want less than the whole file, use the "L" parameter, otherwise, TLOAD always loads the whole track & sector list allotted to the file. This is necessary because DOS never records the last byte of a text file. We can't look for the first "0" as the end mark because we also load random files and they don't use an "0". Therefore, TLOAD without "L" loads the entire last sector even if the file ends in the middle of the sector. You can, if desired, make TLOADS to exact length with "L". Understand? Well, if you don't, examples are given in the documentation with the program.

Now let's go through each item and see what it does, and consider the advantages and disadvantages.

### 1. The RAMEX 128 card by Omega Microware

This card gives tremendous flexibility to do disk emulation, expand RAM and even act as a large print buffer using Diversi-DOS. It also has a high speed VisiCalc load (20 seconds), which is a pleasure, instead of having to wait up to 10 minutes. It's hardware compatible with the Saturn card, so the Saturn software will work properly with it. The only incompatibility is with the Rana controller card and Super Expander Plus. This appears to be a problem with the Rana controller, which will hopefully be corrected in the future. In addition, you must understand that the card only holds 128K, which is not quite a full disk. This does not include DOS, but the real problem is if the DOS is deleted and the space is used for something else, it just won't fit. This is a minor problem, however.

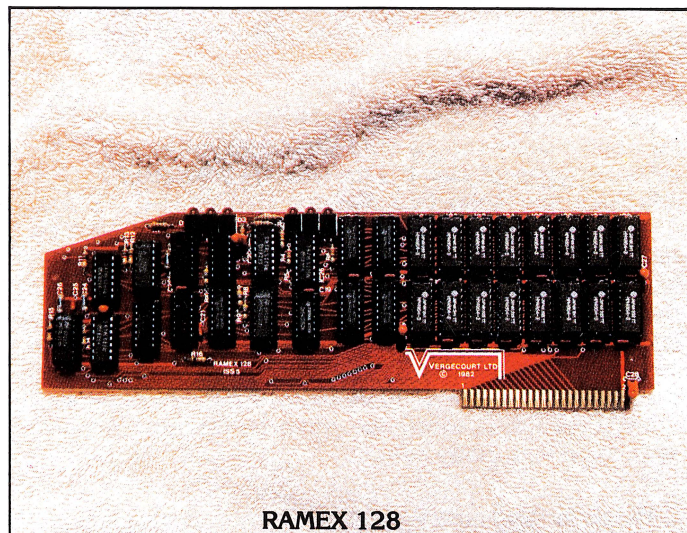
### 2. Microseed Fastload

This is a good general program that allows fast loading of binary and Applesoft programs. It also has a patch program to "patch" DOS when using it with the Syntex Disk emulator. It is compatible with almost every piece of software and is considered excellent for general use. It will not, however, speed up text files.

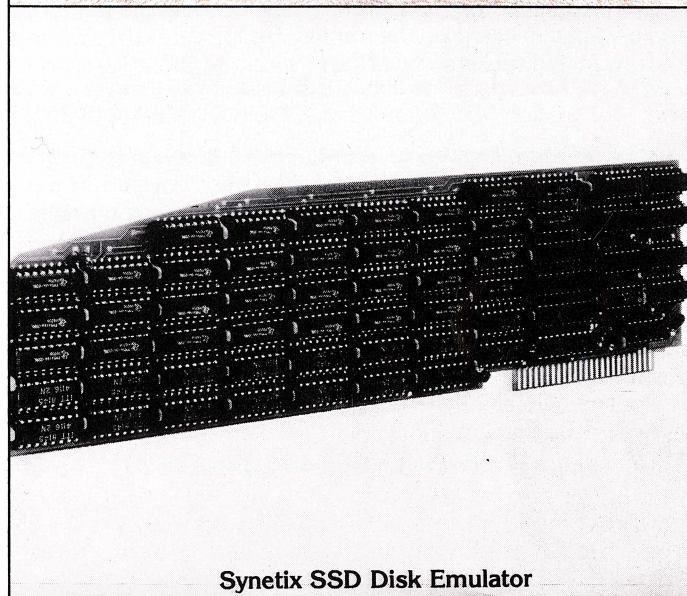
### 3. Diversi-DOS

Diversi-DOS has one of the most unusual marketing approaches known to man. *They tell you to give their program to everyone*, and if the recipient likes it, then he sends them about \$25. They will send you a sticker to put on your drive. Because the program is so reasonably priced and packed full of features, it is selling well. Bill Basham, head of DSR, Inc. is a programming genius in every sense of the word.

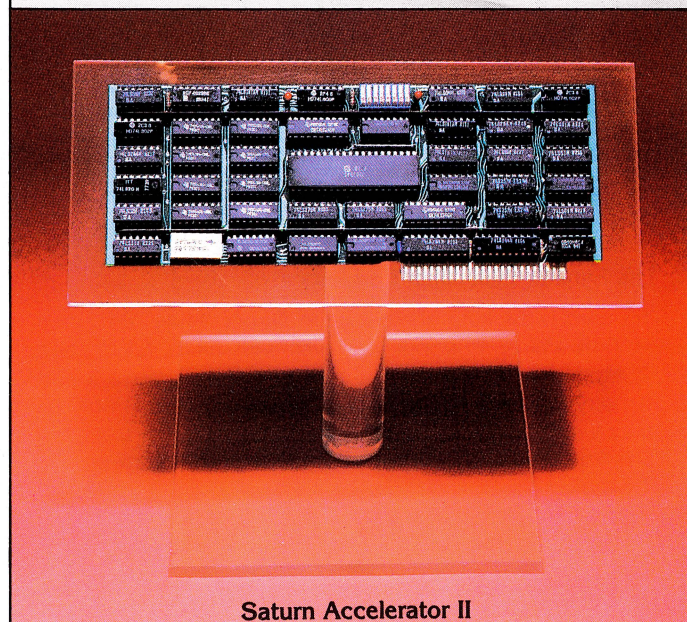
The instructions are on the disk, and will print out automatically if you want. Because Diversi-DOS modifies DOS, any program that has a "trick" DOS may not work properly with the



RAMEX 128



Syntex SSD Disk Emulator



Saturn Accelerator II



program, so be careful. This also applies to protected programs. There is a super fast back-up program on the disk that is a breeze to use.

Some of the more interesting features are the keyboard and print buffer utilities on the disk. This allows you to type on the keyboard while, for example, the drive is running, and not lose any characters. The print buffer is something else. I covered this point in great detail in my buffer article (**Apple Orchard**, April 1983), but for a short explanation, the computer must wait until the printer is finished printing before it sends more material. With the buffer option, the program is stored in the RAM card in Slot 0. If you have a Franklin, it comes with 16K there. If you replace it with the Ramex 128, you have a 128K print buffer! That can be more than 15 minutes of printing, which means you can use the computer for other purposes while the printer prints away.

The buffer is set up to work with a variety of printer cards and RAM cards. Even the PKASO card is included, which is about the best parallel card on the market. But be careful, because the program disables some of the features (temporarily) on the card.

DOS errors are given as numbers and this is also in the instructions. Random access text files were covered in the above, so they will not be repeated here. There was a bug in the first release of Version 2-C: when you read to the end of a text file with an ONERR in effect, you may read some extra garbage data before the ONERR is executed. To see if you have the bug, boot a disk with Diversi-DOS and type **PRINT PEEK (43519)**. The correct value is 223. If you don't see this value, then the following changes will fix the bug:

Boot Diversi-DOS disk and choose option #9

```
LOAD HELLO
2045 POKE 43519,223
SAVE HELLO
```

Use option 2 to add Diversi-DOS to all your disks again.

Interrupts are also discussed, but we'll not cover them here as very few of you will use them. Licensing information is also included along with many other commands. This program is top shelf in every respect.

#### 4. The Synetix SSD Disk Emulator

This card is the king of all disk emulators. It has 294K on it using 64K chips. It works very well with DOS, CP/M and PASCAL, along with many of the fast DOS programs. It also works very well with the Saturn Accelerator II. It can only be used as a disk emulator, and not for buffers or other uses, but for disk emulation, it is untouchable. This card was covered in my Speeding Up DOS article.

#### 5. David-DOS

David-DOS is another fast DOS program with some interesting features. Listed below are these added commands:

/	CATALOG
TLOAD	SPEED LOAD ALL TEXT FILES
TLIST	LIST ALL TEXT FILES
DUMP	BINARY/ASCII
DISA	DISASSEMBLE BINARY
AL	ADDRESS/LENGTH OF LAST LOAD
HIDOS	MOVE DOS IN MEMORY TO CARD #0
FIND	FIND HEX CHARACTER SEQUENCES
DATE	PRINT MOUNTAIN HARDWARE DATE

The documentation is on the disk and can be printed out to the printer. It is quite comprehensive, and the program is a marvel of human engineering. David Weston, the author, is of the same genius caliber as Bill Basham of Diversi-DOS and Dave Winzler of Microseeds. It is a pleasure to have these three experts in the Apple field of programming. I also admire that all three have chosen not to protect their disk. This does wonders if you want to use it with other drives, disk emulators and the like.

The program is easy to use, and the FIND command is interesting. FIND searches for any hex sequence up to 31 bytes long. Hit return before entering the bytes. Put a space between each byte. Example:

#### Keyboard Entry

```
Screen
FIND
FIND
HIT RETURN
FIND HEX:
11 3C 45
FIND HEX:11 3C 45
HIT RETURN
(FOUND ADDRESSES)
```

The program is packed full of uses and I strongly recommend it.

#### 6. The Saturn Accelerator II

Since I purchased my Apple in 1977, I have been waiting for a card like the Saturn Accelerator II. The card has a fast (3.6 Mhz) 6502 and 64K of memory. It does all of the calculations while the Apple or Franklin does the video display. You now have both running at once, and the speed is incredible.

There are switches on the card which allow you to slow down certain peripheral cards, such as the drives. The card has a built-in language card, and the program is put into the memory of the card. A pre-boot is provided with the card with four options on it:

A. Phantom 0 - You would use this for programs written in Integer or Pascal and for programs which require a language card, such as the arithmetic processor.

B. Fast Applesoft - This option is specifically set up for speeding up Applesoft programs.

C. Disable - This option is for all programs which run under CP/M when using the Microsoft Z80 Softcard. It is not needed if



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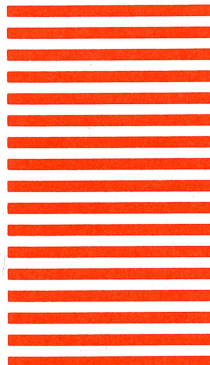
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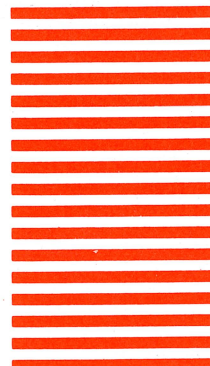
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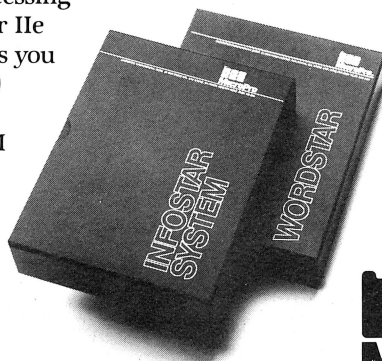
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you use the Appli-Card from Personal Computer Products.

D. Standard - This uses no preboot disk for binary programs which do not require a Language card.

The manual is written in two parts. The first part is for a quick introduction and quick set up. It allows you to use the board instantly for those of us that can't wait. The second part goes into all the detail that you need once you get over the initial excitement of trying the device. I happen to like the arrangement. Also given in the appendix is a complete list of programs and the recommended options to use. Many programs, such as VisiCalc, do not need the preboot.

At this writing, this card is the only one of its type, so there is no competition. If you want to speed up the computer, this is a sure-fire way to do it.

## 7. The Routine Machine

Southwestern Data Systems has always had a reputation of having some of the finest programs available for the Apple. This goes way back when they came out with Apple Doc, and they haven't stopped giving us excellent software since then. Their packages seem to get better with each addition. One of their latest selections is The Routine Machine.

The Routine Machine is a series of programming utilities which can be used with Applesoft programs. You can have the speed and versatility of machine language in Applesoft without knowing machine language, and you can pass variables back and forth from the utility to the program with no problems whatsoever. You decide where in memory to locate the routines, and more than one routine can be used. No debugging is necessary, and use of these routines is simple. A demonstration program is included on the back of the diskette for illustration purposes. An option menu is given and you choose the appropriate selection.

The manual is about 160 pages long, and is packed full of ideas and uses. For the Applesoft programmer, it is heaven. An excellent appendix is also included for references. The package is a piece of art.

Some of the main points of the package:

A. SWAP - This swaps two Applesoft variables without requiring a third variable and without generating garbage which would have to be handled later.

B. PRINT USING - Formats numbers for screen, printer or disk file output. It makes monetary information easy to display.

C. TEXT OUTPUT - This will print text to screen or printer without word breaks at the right margin. It is similar to word-wrap in a word processor.

D. STRING INPUT.RM - This wonderful routine will allow you to enter in commas and colons in input strings. (Try doing this without this routine!)

E. STRING SEARCH - This function find a substring within another larger string. (Where were all these wonderful routines when I began programming the Apple in 1977?)

F. ARRAY SEARCH - This is used in searching a one-dimensional string array for the occurrence of a specified search string, or for the occurrence of a string standing in a certain relation to the search string.

G. BUBBLE SORT - Here we sort the elements of a one dimensional string array, placing all the empty strings at the end.

H. BEEP - Generates a pure tone of a given pitch and duration. It can also be used to pause a program. Extremely useful for

generation of music.

I. SOUND EFFECTS - Simply lets you use sound effects in your program.

J. FIX LINK FIELDS - This recalculates and establishes the link fields in an Applesoft program.

K. ERR - This function fixes the stack pointer in preparation for continuing the operation of a running Applesoft program when RESUME will not be used. It will also optionally return the error code and line number of the error.

L. ERR MSSG - This will print the usual Applesoft or DOS error message from a running program without halting program execution. (Can you believe all this for \$64.96?)

M. GOTO - This allows the equivalent of Applesoft's GOTO statement with the line number specified being given by a variable.

N. GOSUB - This allows the equivalent of Applesoft's GOSUB statement with the line number specified being given by a variable.

O. LINE DATA RESTORE - This performs a similar function to Applesoft's RESTORE command, with the exception that the line number to which the DATA pointer is restored can be specified.

P. DATA ELEMENT SELECT - This advances the DATA pointer a given number of positions relative to its current position. This gives a random access-like aspect to DATA statements.

Q. XNUM - This will convert numbers between decimal and hexadecimal notations.

R. MEMORY MOVE - Moves a block of memory from one location to another.

S. RESTORE AMPERSAND - This will restore the ampersand vector to its original value, as it was before the Applesoft program was run.

T. PTR READ - This will read any two byte pointer in memory and return the decimal value in a numeric variable.

U. PTR WRITE - This sets any two byte pointer in memory to the value or address specified.

V. SHAPE GOBBLER / SHAPE VIEWER - This is a utility provided to convert existing Applesoft shape tables into usable Routine Machine Modules.

W. SHAPE TABLE VIEWER - This utility is provided to allow you to examine raw shape tables. this can be useful, especially in cases where you might not even be sure if a binary file is in fact a shape table.

X. HIRES ASCII - This is a shape table of 95 ASCII characters used for printing test on the HIRES screen.

Y. BLOAD - This BLOADs binary files about 4 times faster than normal. It will not, however, speed up fast DOS diskettes that I have seen.

Z. BINADR - Returns the length and load address of any binary file on a disk, without loading the file.

AA. RESET NORM - This sets the RESET vector back to its normal condition, so that pressing RESET will put the use in direct command mode with an Applesoft prompt.

BB. RESET ONERR - This sets the RESET vector so as to generate an Applesoft error code when RESET is pressed. If an ONERR GOTO statement is in effect, control will then pass to the error-handling routine as in the case of a normal error occurrence.

CC. RESET RUN - This sets the RESET vector so as to re-run the current Applesoft program when RESET is pressed.



DD.RESET BOOT - This will boot the computer when RESET is pressed.

EE. FREE SECTOR COUNT - This allows determination during program execution of the number of free sectors on a disk in a selected drive.

It should be mentioned that not all of these programs speed up the software, but because they are written in machine language, they certainly do run faster than a normal Applesoft program. The other benefits are additional.

#### 8. The CCS Model 7811 Arithmetic Processor

The 7811 Arithmetic Processor Unit from California Computer Systems is a powerful floating-point hardware unit which, under the control of the CCS Applesoft on the supplied diskette, significantly improves the execution speed of mathematical functions. Program execution speeds can be increased by as much as 70 to 1, depending on what function you are working with.

The only drawback is that you have 6 significant digits instead of the usual 8. This, in my opinion, is a small sacrifice. If you must have 9 digits, turn the card off and operate Applesoft normally.

I have not tried this card out on the Apple //e, but California Computer Systems recently informed me that the Arithmetic Processor has been tested on the //e and is compatible. The card plugs into any slot, and you simply boot the enclosed diskette.

The following benchmarks were done to illustrate the speed difference of this card:

Function	Speed Ratio
MUL	1:1.76
FDIV	1:2.56
EXP	1:10.07
SQR	1:71.24
RND	1:3.50
LOG	1:7.98
COS	1:9.48
PWR	1:4.80
TAN	1:15.50
ATN	1:13.55
INT	1:1.18
ACOS	1:32.20
ASIN	1:27.62
LOG10	1:23.98
PI	1:12.44
INV	1:3.50
SINH	1:10.57
COSH	1:10.66
TANH	1:8.08

As you can see, some of the improvements are substantial. The card works well with the Saturn Accelerator in the limited testing that I did.





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# The Accelerator II

*Review by Barry D. Bayer*

**S**aturn Systems, Inc., of Ann Arbor, Michigan has moved from high density memory expansion boards and VisiCalc pre-boots to a \$600 board with a "fast" 6502C and 64K of "fast" RAM (Random Access Memory), that will make your Apple II really move.

The Accelerator board installs with very little problem by dropping into Apple Slot 0, 1, 2, 3 or 4. But which Slot? Slot 0 is not recommended for various reasons, Slot 1 contains my printer interface, 2 my modem, 3 my 80 Column Card, and 4 my 128K card. My modem-terminal program (Hello Central!) is very easily configurable, so I banished the modem to 5, liberating Slot 2 for the Accelerator board.

Because the board does not speed up speed dependent tasks such as modem communications and disk I/O, I was also required to set DIP switches and to notify the Accelerator board which slots should operate at standard speed. And that's all the installation there was. No screwdriver, no IC puller, no soldering iron.

Many programs (there's a list in the manual) will boot and run without further ado. For others, it is necessary to pre-boot a disk which will allow you to make the Accelerator board a phantom Slot 0, to add machine code which speeds up the language in ROM on your motherboard, or to disable the Accelerator board, completely (but only until powerdown or rebooting of the Accelerator disk). There's a routine to modify the Pascal APPLE1 disk, or its equivalent, and another to modify a CP/M disk (to turn the Accelerator board off if you're using CP/M). (It doesn't do too much good to add a fast 6502 if you're still using a slow Z-80.)

The preboot works even if the application program you are trying to use is copy protected. Most programs seem to work with the Accelerator board on, although they crash unless you turn the Accelerator board, first, using the preboot. (For example, the Videx 80 Column card preboot for Applewriter II doesn't work properly unless you turn the Accelerator card off. Why would anyone need an Accelerator board for a word

processor? Well, it scrolls faster, searches faster, and completely eliminates any typeahead. Its not crucial, by any means, but it is handy.

The first thing I did after installing the Accelerator board was to boot VisiCalc, and try it out with a large template which used to take over a minute to recalculate. With the new installation it took 22 seconds. I then ran some tests with time consuming formulae, and things did speed up considerably. (One change that is immediately noticeable is that the VisiCalc "beep", which is undoubtedly generated by a machine language subroutine which "toggles" the speaker for a given length of time at a given frequency) is much shorter, and octaves higher. (It turns out that all such sounds including "music" and "buzzes" end up much higher and shorter, leading to some amusing and unanticipated effects.) VisiCalc loading speeds up a little; as previously stated, disk access speed is not altered, but accelerated VisiCalc processes information coming off the disk so quickly that the drive never stops. But VisiCalc is so quick, in most cases, that it's really difficult to say that it "feels" different with the Accelerator.

But try a pre-boot such as Omega Microware's Super Expander Plus, with a Videx 80 Column card, and a 128K card, and you get a program which "feels" slow. Clearing memory, using the /C command takes about 10 seconds without the Accelerator, and 3 and a half seconds with the Accelerator. Recalculating a 136K file takes a long time without the board, but a third or less as long with the board. Scrolling the 80 column card can be jerky and slow, but not with the Accelerator board, which speeds things up so much it is almost like 40 column video. The expanded program is so different that the speedup is immediately noticable.

So much for impressions. From time to time certain "benchmark" programs are published to indicate how fast a particular computer is. One set was published in the January, 1982 issue of *BYTE* Magazine, in Gregg Williams' article on his first glimpse of the IBM Personal Computer. The five programs constituting the Benchmark are shown in Figure 1.



	Byte Tests		Bayer Tests			
	IBM PC	Apple II	Apple II w/o Acc.	Apple II with Acc.	% of Time of:	
					Apple Time	IBM Time
Test 1	6.43	6.66	6.2	2.1	.34	.33
Test 2	23.8	29.0	26.3	8.7	.33	.37
Test 3	12.4	13.9	12.3	4.3	.35	.35
Test 4	23.0	32.3	27.7	9.3	.35	.42
Test 5	190.0	241.0	194.8	66.4	.34	.35

Figure 2

1 PRINT CHR\$(7)	1 PRINT CHR\$(7)
60 A = 2.71828	60 A = 2.71828
80 B = 3.14159	80 B = 3.14159
100 FOR I = 1 TO 5000	100 FOR I = 1 TO 5000
320 NEXT I	120 GOSUB 1000
1000 PRINT CHR\$(7)	320 NEXT I
Test 1	500 PRINT CHR\$(7)
	600 END
	1000 RETURN
	Test 3
1 PRINT CHR\$(7)	1 PRINT CHR\$(7)
60 A = 2.71828	80 A\$ = "ABCDEFGHIJKLM"
80 B = 3.14159	100 FOR I = 1 TO 5000
100 FOR I = 1 TO 5000	120 B\$ = MID\$(A\$,6,6)
120 C = A / B	320 NEXT I
320 NEXT I	1000 PRINT CHR\$(7)
1000 PRINT CHR\$(7)	Test 4
Test 2	
	1 PRINT CHR\$(7)
	2 SIZE = 7000
	3 DIM FLAGS(7001)
	4 PRINT "ONLY 1 ITERATION"
	5 COUNT = 0
	6 FOR I = 1 TO SIZE
	7 FLAGS(I) = 1
	8 NEXT I
	9 FOR I = 0 TO SIZE
	10 IF FLAGS(I) = 0 THEN 18
	11 PRIME = I + I + 3
	12 K = I + PRIME
	13 IF K > SIZE THEN 17
	14 FLAGS(K) = 0
	15 K = K + PRIME
	16 GOTO 13
	17 COUNT = COUNT + 1
	18 NEXT I
	19 PRINT COUNT, " PRIMES"
	1000 PRINT CHR\$(7)
	Test 5
	Figure 1

(For an explanation of what these programs do and why they were chosen, see the Williams article on Page 54 of January 1982 *BYTE*. The programs here are the same, with the addition of a line to ring the Apple's "bell" at the beginning and end of each program, to help with starting and stopping the timings.) In general, the *BYTE* article showed the Apple to be between 4 and 27 per cent slower than the IBM PC

Figure 2 shows the raw results of my tests. For reference I have included the *BYTE* Apple and IBM results. For some reason, my figures for the Apple without the Accelerator board are less than *BYTE*'s, but the real contrast comes with the Accelerator board. In all cases, the accelerated Apple took about one third the time of the regular Apple, which means that the Accelerator board makes the Apple a *lot* faster than the PC.

But the Accelerator board is not an unmitigated pleasure. Saturn Systems has set the Accelerator board to automatically slow down for disk access and modem operation, but games are not automatically slowed. (Pinball or PacMan are simply impossible going three times faster.) If you move around a lot between one program and another, you're going to be turning off your computer and doing a cold boot, more often than without the board. But you can live with that. What you might not be able to live with is a 500 milliamp draw. (That's 25 per cent of the maximum current rating of Apple's power supply.) Now my Apple is still working with the lineup shown in Figure 3, but I really wonder how close I'm getting to my power supply's limit

- Slot 0 - 16K Memory Expansion
- Slot 1 - Mountain Hardware CPS Multifunction Card
- Slot 2 - Saturn Accelerator card
- Slot 3 - Videx Videoterm
- Slot 4 - Hayes Micromodem II
- Slot 5 - 128K Memory Expansion
- Slot 6 - Disk Controller
- Slot 7 - blank (*Barry, how could you?*—PCW)

Figure 3

Last, but certainly not least, the Accelerator board has a manufacturer's suggested retail price of \$600. That's a good percentage of the cost of an Apple system. Is the board worth the money, or should you use it to "upgrade" to a new, modern computer, or even half a 5 magabyte disk. That's a very personal decision and, I suppose it depends on how you use your Apple. If it's strictly a game machine, the answer is no. (Let me take back a little bit of that. If the game the computer is playing is chess, the answer might well be yes.) If you use a lot of large memory 80 column VisiCalc, the answer might be yes, although things like Lotus Development's 1-2-3, which is not being provided for the Apple, make a strong argument for purchasing an 8088 based computer. If your programs tend to be disk bound, the Accelerator board will probably not speed it up much by itself. If the program does a lot of calculating and/or a lot of string handling (really fast garbage collection with the Accelerator board) it may help.

Finally, if you'd like to look your friend in the eye, (the one who purchased an IBM PC last month, and is chiding you to junk your "toy" and get a "real business computer"), and explain that your Apple is two and a half times faster than his pokey PC, then the Accelerator board is a must.





# WPL - The Sleeping Giant

## Part One - Introduction

*by Richard Loggins*

**H**idden deep inside your AppleWriter is an enormously powerful force just waiting to be unleashed. Once aroused from its dormant state, its power can be harnessed to perform feats of magic. It's called Word Processing Language (WPL for short), and is probably the most overlooked feature of AppleWriter.

Once under control, this power can be used to print any number of form letters, specialized reports, quotations, and more. It can personalize letters, insert financial information, and even replace other software you would normally purchase. WPL won't replace VisiCalc or Multiplan, but it can provide an acceptable alternative to mailing lists and small databases.

This series of articles will remove the mystical shroud surrounding WPL. It will help you to take advantage of what you already have - hopefully without frustrations.

We'll start with simple WPL commands and build on them a little at the time. WPL programs will be developed that will allow some pretty neat and useful applications. You'll be surprised to discover that you've already used many of the WPL commands that we'll discuss.

As an added benefit, the WPL programs should work for AppleWriter /// and AppleWriter //e. Just pay attention to the file name notations and you'll do fine.

### Command Origins

WPL commands can originate from (1) the keyboard, from (2) a text file, or from (3) *within* a text file as it is being printed.

When the command originates from the keyboard, it is known as originating from the *immediate* mode. Commands that come from a text file, or a text file as it is printed, are known as originating from the *deferred* mode.

If you have used AppleWriter, at one time or another you have used the **CTRL-P** command to view or change the current printing parameters. By changing any of the printing parameters, you have already been using WPL, although you didn't know it!

In fact, you use WPL each time you load a file, save a file, change character sets, etc. All of the AppleWriter immediate mode commands are actually WPL commands. That ends the tutorial on WPL immediate mode. Easy, wasn't it?

Now that you have mastered the immediate mode (and even if you haven't), it's time to conquer a little of the deferred mode via printing a text file.

If you have printed letters or other files using Apple Writer, you have probably embedded printing format commands within the text. The most common command used is the **“.ff”** (or **“.FF”** if you prefer) to issue a form feed. This command causes the printer to advance the paper to the top of the next page. Surprise: this is also a WPL command!

The rest of this article will be devoted to the WPL commands that originate from a text file on disk, how they are used, and WPL programs.

### Text Commands

Commands are one or more of a specified set of instructions that tell your computer what action to take. Commands are nothing more than a predetermined sequence of characters, and are easier to learn than a foreign language or shorthand.

WPL commands are composed of one to three letters. Each command will cause a specific action to take place. The shortest command is simply the letter **“P”**, which is used to insert a comment into the program.

Comments are brief statements that explain portions of the program. They are not required, and are totally ignored during program execution.

Many of the commands used in a WPL program are identical to the commands used during normal operation of AppleWriter. The command to load a file **CTRL-L** is the same in normal operation and in a WPL program. Both must be followed by a legal file name, and both will load a file.

The primary difference between normal operation and execution of a WPL program lies in the understanding of what



you can't see. Under normal operation, you can see the CONTROL key being pressed; under WPL you can't.

This brings forth the first rule:

**Rule 1: The first character in a line following a blank character is treated as a control character.**

This means if the first letter on a new line is a space, and the space is followed by the letter "L", the letter "L" is treated as CTRL-L.

So a command such as

```
L .D1/MYFILE
```

with a space preceding the "L", would be interpreted as meaning "LOAD from Drive 1 the file named MYFILE", and would act accordingly. This allows use of all the CONTROL commands normally used in AppleWriter from the immediate mode.

Which brings up the question of why it was mentioned in the first place. Under WPL program control, AppleWriter uses two different displays, both of which can be viewed on your monitor.

One display is the normal display you see whenever you use the text editor portion of AppleWriter. The other screen display we will call the WPL display. It is used to inform you what is taking place, to request information from you, etc., while a WPL program is being executed.

To clear the text editor display, you enter CTRL-N followed by Y, and press «RETURN». This will erase the text editor display, along with any file you currently have in memory.

The WPL display is another matter. It is erased by using a CTRL-«Backslash». In a WPL program, this command would appear as:

```
PPR«Backslash»
```

with a space preceding the first P. More on this later.

Simply having all of the CONTROL commands normally used by AppleWriter isn't enough to accomplish very much. There are two more essential items we must include to make effective use of WPL.

The two items we must add are labels and variables. Fortunately, both of these items exist, leaving only the problem of understanding them.

We can now say that a WPL program consists of only three items: labels, commands, and variables.

## WPL Labels

Labels are to WPL programs what road maps are to travelers, or addresses are to mail carriers. Labels provide WPL with a method to identify a unique location. And like addresses, no two should be the same.

Labels are not required in a WPL program, but they are used to control the sequence of program execution. Labels are the creation of the person writing the program, and generally are descriptive of the function performed by a part of the program.

For instance, suppose you have a label named "LOOP". If the program is directed to go to "LOOP", it will do so and carry out the instructions following the label. This brings up the rule for labels:

**Rule 2 If the first item in each line is not a blank character (a space), all of the following characters up to the first blank character are treated as a label.**

For our program listings, we'll use a format that should make it easy to identify labels from commands. Each program will have the heading shown below, followed by one blank line. Labels will start to the left of the space following "WPL", and commands will be indented to start at the right of the space.

WPL Program: [Program Name]

LABELS will start here.

COMMANDS will start here.

WPL programs are created by using the text editor portion of Apple Writer. When you enter these programs, be sure to start your program with the first label, and *not* our program indicator (the part that says "WPL Program").

## Variables

WPL supports two different types of variables. The first type is called *numeric* variables, and the second type is called *string* variables.

Numeric variables are used for representing numbers. There are only three numeric variables in WPL, represented by the letters X, Y, and Z.

String variables are used to represent a series of characters. This can be letters, numbers, or a combination of both. WPL provides four string variables: \$A, \$B, \$C, and \$D.

If you have experience programming in BASIC, don't be alarmed by the position of the "\$" in the string variable name. In WPL, the "\$" always comes before the variable.

## WPL Program Construction

Now that the components of a WPL program have been introduced, we'll cover a few basic rules about WPL programs, and put this information to use. As the man said, a picture is worth a thousand words.

After each program listing, a line by line discussion will examine each command and what it does.

Our first WPL program will be simple. It will load a file from the disk in drive one and print the file. For Apple /// owners, drive one is the internal drive. For Apple II owners, drive one will be Slot six, Drive one.

Conventional Apple /// pathnames will be used (".D1/") to refer to the drive. If you have an Apple II, make sure you change this reference to agree with DOS and Apple Writer //e.

Before a WPL program can be written to load and print our test file, we must first have a file to work with. The letter shown in Figure 1 will be used as our test file, and will be modified occasionally to suit our needs.

Get your Apple Writer up and running; type the letter, and save it with the name of "TEST.LETTER" on the disk in drive one.

When you have the letter saved on your disk, erase memory and enter the following WPL program.

WPL Program: PRINT.LETTER

INITIALIZE

PND

NY

LOAD

L .D1/TEST.LETTER

PRINT



John Johnson  
123 Oak Street  
Denver, CO 88888

Dear John:

We are having a party to celebrate Independence day, and would like you and your wife to attend.

We'll supply all of the food and drinks, so all you have to bring is yourself and your wife.

The party will start at 4 p.m. and last until everyone is tired.

Sincerely,

Sam Smith

Figure 1

PNP  
QUIT  
PQT

Check each label to make sure it starts at the very first position in each line, and that the commands are indented. Remember, WPL won't recognize the labels if there is a blank character (space) in front of them.

When you are sure the program is correct, name it "PRINT.LETTER", and save it under that name on your disk.

Let's analyze the program and see what it will do. The first line of the program is a label. This label describes this part of the program as "Initialize", and is where our initial procedures are located.

The second line contains the command **PND**, which will turn off the text editor display (N for NO and D for Display). This only turns off the text editor, and not the entire video display.

By turning off the text editor display, our WPL program will have control of what is displayed on the monitor. With the text editor turned off, the WPL program will also execute about five times faster.

Line three, **NY**, is a command to clear memory. Since WPL treats the first character (N) following a blank character as a control character, this command is equivalent to entering CTRL-N followed by a Y from the keyboard in the immediate mode. The result is to erase memory and clear the text editor. That's why you saved both the letter and the WPL program to disk first.

Line four is another label. It describes the portion of our WPL program that will load the file.

Line five is a command. Again, the "L" is treated as a control character, making the command CTRL-L. This is followed by the location (.D1), a delimiter (the slash), and the name of the file to load. That's Apple ///, remember: on the Apple II//e, it would be L TEST.LETTER,D1.

Next is another label. This label describes the routine that will print the letter.

In line seven we use the command that will cause the letter to be printed. This is equivalent to entering **CTRL-P**, followed by **NP** from the immediate mode, and will result in printing the letter.

The last two lines of our program provide a formal ending. The label **QUIT** is followed by the command **PQT**, the command that will terminate a WPL program.

Before we use the WPL program, check your printing parameters and your printer. Get back into the text editor portion of Apple Writer, and we'll use our program (WPL programs *cannot* be executed from the printing parameters portion of Apple Writer).

Now, enter CTRL-P from the keyboard. The lower portion of your monitor should display:

[P]rint/Program:

Enter **DO .D1/PRINT.LETTER**, followed by the «RETURN» key. This will cause our WPL program to be executed. If you have entered everything correctly, the WPL program will load the letter, print it, and return control back to the text editor.

Since we ended the WPL program without clearing the text editor memory, the letter that was loaded by the WPL program will still be in memory, and should be displayed on your monitor.

If the WPL program does not execute as it should, press the «ESCAPE» key. The «ESCAPE» key will abort any WPL program, and return control to AppleWriter.

### Play it Again

Printing a single copy by using a WPL program is more difficult than just printing a letter directly from AppleWriter. But our simple WPL program has provided the foundation for more complicated applications that will overcome this limitation.

By changing this WPL program, we can print up to 65,535 copies of any file, all automatically. This is accomplished by using a variable and a loop.

Clear memory, and enter the following WPL program. This



program will print five copies of our invitation, and demonstrate how variables and loops can be used.

WPL Program: PRINT.5

```
INITIALIZE
  PND
  NY
  PSX 5
LOAD
  L .D1/TEST.LETTER
PRINT
  PNP
  PSX - 1
LOOP
  PCP
  PSX - 1
  PGO LOOP
QUIT
  PQT
```

After entering the program, give it the name of "PRINT.5", and save it on your disk.

The first three lines of this WPL program are the same as our first WPL program. The text editor display is turned off, and memory is cleared.

In line four, we encounter a new instruction, **PSX 5**. This command ("PS") can only be used with numeric variables. Here, it sets the variable X to equal five. This is the number of copies we want our WPL program to print.

Line six loads our invitation, and line eight, **PNP**, prints the first copy.

In line nine, the **PSX** command is encountered again, but is used differently. Instead of setting the variable X to a predetermined value, the number contained in X is decremented by one, leaving the number four in X (five minus one is four).

The **PSX** command can be used to set the variable X to a specified value, subtract a specified quantity from the present value of X, or add a specified quantity to the present value of X.

Line ten introduces a new label, **LOOP**, that will be used to control the printing of the remaining four copies of our invitation.

Line eleven is a new command, **PCP**, which causes the next invitation to be printed. This command is the same as the "Continue Printing" command used in the immediate mode. **PCP** is used instead of the **PNP** command. This takes into account the top margin and top line options of the printing parameters in the event they are used.

Line twelve decrements the variable X again, leaving the number three in X.

The instruction in line thirteen, **PGO LOOP**, is a branch command. When this command is encountered, WPL will search the program for the label "LOOP", and transfer control of the program to the instructions following the label. In effect, this command says "GO to the label named LOOP."

This will cause the command **PCP** to be executed again, followed by the **PSX** command. Thus, we have set up a loop that will print several copies of our invitation.

To terminate the loop, we rely on the variable X. When the variable X is decremented to zero, the **PGO LOOP** instruction will be ignored, and control of the program will proceed to **QUIT**.

This action is known as a "controlled error" situation. Whenever a variable in WPL is decremented to zero, an error is generated. Whenever an error is generated, the next instruction is ignored.

In this program, the error will be generated after five copies of our invitation have been printed, breaking the loop and ending the program.

To use this WPL program, again enter CTRL-P followed by **DO .D1/PRINT.5** from the text editor.

### Pick a Number

As the last WPL program ("PRINT.5") is written, it will print five copies of the invitation. All well and good if all we will need is five copies. However, there may be times when it is desirable to print more or less than five copies.

By introducing three new commands, the WPL program can be modified to print as many copies as needed.

Clear memory, load the WPL program named "PRINT.5", and make the following changes. Save this program with the name of "PRINT.NUMBER" on your disk.

WPL Program: PRINT.NUMBER

```
INITIALIZE
  PND
  NY
  PPR<Backslash>
GETNUMBER
  PIN How many copies? =$A
  PCS/$A/0/
  PGO QUIT
  PSX $A
LOAD
  L .D1/TEST.LETTER
PRINT
  PNP
  PSX - 1
  PGO LOOP
  PGO QUIT
LOOP
  PCP
  PSX - 1
  PGO LOOP
QUIT
  PQT
```

The first three lines of the modified WPL program are the same. Line four of the program introduces a new command **PPR«Backslash»** that will clear the video display.

This command is composed of two items. The command **PPR** tells AppleWriter to print on the WPL video display the information that follows. In this case, it is printing a **CONTROL-«Backslash»**.

To enter this command, you must press **CTRL-V**, followed by a **CTRL-«Backslash»**, followed by another **CTRL-V**.



The result you should see on your monitor is the backslash displayed in inverse (dark letter in white block.) The CONTROL-V allows control characters to be entered into your text that will be passed to a device without affecting AppleWriter. Be careful entering this command.

Line five, **GETNUMBER**, is a new label that begins the routine to determine how many copies are to be printed.

Line six contains a new command, **PIN** that will wait for an entry. When this command is executed, the message "How many copies?" will be displayed on the video monitor.

When a number is entered and «RETURN» is pressed, the number will be placed in the "\$A" variable. Notice there is no space between the equal sign and the \$A variable.

Line seven introduces another new instruction, the **PCS** command. Notice there are no spaces in this line (other than the spaces preceding the command). This instruction is used to compare the information contained between the first and second slash marks, with the information contained between the second and third slash marks.

In this case, it is comparing the number contained in \$A with the number zero. If the two items being compared are identical, the result is said to be valid, and no error is generated. Therefore, if a zero was entered for the number of copies to be printed, the result of the comparison would be valid, and no error would be produced.

The result of this comparison will determine what action the program will take. If the two items being compared are *not* identical, the result is said to be invalid, and an error is generated. So if a number was entered that was not zero, the result will be invalid, and an error will be generated. As with numeric variables, when an error is produced, the next instruction, to quit, is ignored.

If the user entered a zero, no error will be generated, and the **PGO QUIT** command will be executed. This will cause the WPL program to end, as there are no copies to be printed.

Let's try that again. If a number greater than zero was entered, the comparison result will be invalid, an error will be generated, and the **PGO QUIT** instruction will be ignored. Sounds like the long way around, but it works.

This action will allow the **PSX** command to be executed, assigning the number in \$A to the variable X.

Lines ten through thirteen of the program operate as before. The invitation is loaded, and the first copy is printed.

In line fourteen, X is again decremented to account for the first copy being printed.

The next two lines (fifteen and sixteen) are used to determine if more than one copy was desired. If a number greater than one was entered, no error will be generated when X is decremented in line fourteen. This will cause the program to branch (**PGO LOOP**) to the label **LOOP**.

If the number "1" was entered, an error will be generated when X is decremented in line fourteen. This will cause the **PGO LOOP** instruction to be ignored, and the **PGO QUIT** command will be executed.

The rest of the program will execute as did our previous WPL program, **PRINT.5**.

### Choose Your File

So far, so good. The last example will allow you to specify how many copies of the invitation you wish to print.

If we make just one more change to the program, we will be able to load any file we wish, and print as many copies as desired.

Once again, clear memory and load the last WPL program. Make the following modifications, name it "YOUR.CHOICE", and save on disk. This will be our last accomplishment for this article.

WPL Program: **YOUR.CHOICE**

**INITIALIZE**

**PND**

**NY**

**PPR<Backslash>**

**GETNAME**

**PPR**

**PIN Name and Location of file: =\$B**

**PCS/\$B//**

**PGO QUIT**

**PPR**

**PPR**

**GETNUMBER**

**PIN How many copies? =\$A**

**PCS/\$A/0/**

**PGO QUIT**

**PSX \$A**

**LOAD**

**L \$B**

**PRINT**

**PNP**

**PSX - 1**

**PGO LOOP**

**PGO QUIT**

**LOOP**

**PCP**

**PSX - 1**

**PGO LOOP**

**QUIT**

**PQT**

We have inserted a new routine ("GETNAME") into the WPL program. This routine will print a blank line (PPR). It will display the message "Name and Location of file: ", and wait for a file name to be entered. The name that is entered will be assigned to another variable, \$B.

Again, we will use the **PCS** command. This time, we will compare the information in \$B with "nothing", to see if the «RETURN» key was pressed without a name being entered. To compare \$B with "nothing" (or a null string), make sure there is no space between the second and third slashes.

If the «RETURN» key was pressed with no name being entered, the result of the comparison will be valid, and the **PGO QUIT** command will be executed.

If a name was entered, the result of the comparison will be invalid, an error will be generated, and the **PGO QUIT** command will be ignored.

This does not mean the program will operate correctly if you enter an illegal file name or location. If you do this, when the



WPL program attempts to load the file, a system error will be produced, and the WPL program will terminate.

After the completing of the comparison test, control will pass to the following command (PPR), which will print a blank line. The next command (another PPR) will be executed, and the program will resume with GETNUMBER.

The number of copies to be printed is determined in the routine named GETNUMBER. This is the same routine used in our last program.

The routine named **LOAD** will load the file name you assigned to \$B into memory.

The rest of the program will print the desired number of copies, and terminate the program.

Now you have a small, general purpose WPL program that will allow you to load and print as many copies of a file as you need.

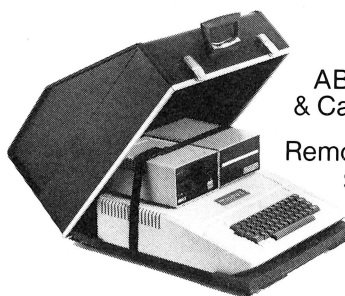
In this first article, the structure of a WPL program, the basic commands, and the flow of control have been examined. With some thought, a little work, and a dash of creativity thrown in, you should be able to modify these samples to perform some more useful tasks.

In our next article, we'll move on to more advanced techniques that will allow letters to be personalized, printing of multiple files, and some other interesting features.

Before we're finished, we'll write a WPL program that will create and maintain a mailing list, do automatic insertion, and who knows what.



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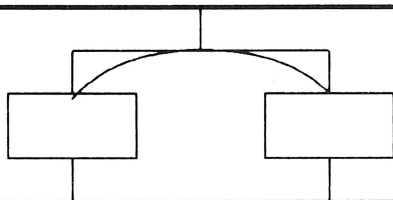
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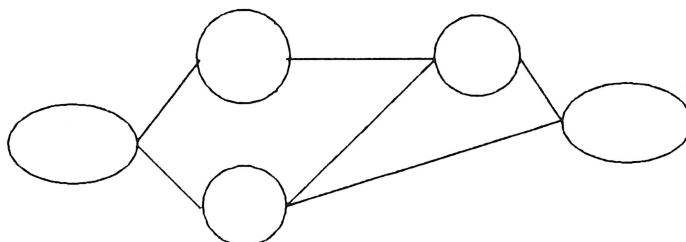


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# Data Management

*by Malcolm Slovin*

**M**anaging your data is not the easy task many software vendors would have you believe. Software ads for "database" systems attempt to impress you with their easy data entry methods, fast sorting and searching routines and flexible reporting formats. These ads conjure up visions of days of leisure while your new computerized filing system works unceasingly (and certainly flawlessly) to keep your business organized and profitable. In point of fact, much thought, effort and learning are required before a "database" system will perform as an integrated part of your business.

What we'll do here is to begin exploration of the area of "database" systems, and provide information and examples on choosing and using these software systems in your business. As a first step it is important to understand what a "database" system is and a bit of how they work. In future articles I hope to provide some reviews of current software and world business examples of their use and abuse.

Much of this information is derived from the activities of the International Apple Core's Data Management Special Interest Group, a group which concentrates on the various software packages available for filing systems, data base systems and possibly, data analysis systems. The SIG's interest is not only in what these packages are capable of doing but also in how they accomplish the data management task. This includes factors such as storage device formatting, virtual memory usage, types of storage files created and print facilities.

As a starting point let's divide a computer system into two areas: the computer itself, and the storage devices. Systems software (in whatever form) controls the movement and interaction of data within and between both areas. At this level we are concerned with the management of data by those utilities and programs that directly control the operation of the computer system. It is therefore important to look closely both at operating systems and data management utilities.

## What's a Database?

The term "database" has been used to cover everything from simple filing systems to program generators. In a simple filing system, data items are stored in records and the records are stored in some organized fashion in a file. This is similar to the common filing cabinet kept by most homes and businesses. One file cabinet might contain all of the information about each of our customers, and each paper file folder would represent an individual customer. The information in each customer's folder represents data items which are usually entered next to the appropriate field name in the folder. The name of John Doe appears in the NAME field and his address appears in the

ADDRESS field. (He also happens to manufacture Widgets which appears in the PRODUCT TYPE field).

In a computer filing system of this type, one made up of similar or the same types of records, the records form a flat file or data file. Programs are then written to allow you to access these records, and the data items they contain, so that you can add, update (or change), delete and report on the information contained in the filing system. In the "good old days" (five to ten years ago) programs were written specifically to access that particular file and its contents. If you developed a new file then a new set of programs had to be written to perform the same set of functions for this new set of information.

Fortunately, programmers got tired of "re-inventing the wheel". This gave rise to the type of filing system available today. A set of programs are developed, each of which performs a specific function such as Add Data to The Record, Delete Data, Add A Record, Delete A Record, etc. These "routines" can be used to access information contained in several different files, although only one file can be accessed at a time. If you want to add data to your Customer file you must first finish with your Accounts Due file and put it away before opening your Customer file. You cannot easily combine data from both of these files for report, nor can you update both files simultaneously even if they both contain some of the same information.

Although the "routines" approach may seem superior to the specific program approach, you still lose something. A program written specifically for your application is a customized piece of software and as such can provide records tailored to your exact needs in an extremely efficient manner. However, routines cannot be easily customized. In essence, you may have to tailor your business requirements to the systems requirements if you want to use that software. For example, you may have a small paragraph which summarizes your customer's past dealings with you. In the custom system these paragraphs could be of any length while in the "routines" system there may be a requirement that no field (in this case the one called PAST DEALINGS) have a length greater than 256 characters. If you couldn't describe your customer's past history in 256 characters or less you'd be out of luck (and room).

Most of the systems on the market today are variations on the "routines" type of filing system, although for obvious reasons many businesses are going back to having custom systems developed for them (just like in the old days). If you can use a simple filing system it is important that you determine the limitations of the system before you purchase it so that it meets most or all of your needs. Don't trust the package blurb to "tell it



like it is". One way to find out about any software system is to call the company that produces or markets the product and ask for the names and numbers of two or three references. Then *call them!!* In addition, ask the sales people of your local computer store to refer you to others who have purchased the package.

Data files in general have several drawbacks. First, you are bound to have redundant data in several of your files. How many times are you going to have to repeat John Doe's name? If you have a customer record for him, his name will appear there, and if you have an accounts due record for him, his name is likely to appear there too. If his name, address, or anything else changes, then you must be sure to change it in both places or you're going to have some interesting creative financing for John Doe's accounts. The problem of Data Redundancy can lead to the second problem - that of Data Integrity (the creative financing referred to above). Inconsistencies among data files can cause incredible problems in a business, not to mention loss of money.

### The DBMS

These problems and others have led to the development of sophisticated DataBase Management Systems (DBMS) which provide for the integration of data files into a database and the orderly management of the data by generalized software routines. In a DBMS it is not only important to define what data is to be stored, but also how it should be stored. It is important to define the relationships between the files and/or data and then choose the proper type of DBMS.

Three general types of database structures are possible (with variations on the theme): Relational, Hierarchical and Networked. Each of these database structures has something to offer the user which is different than either of the other two. In general, however, using one of these database structures and the systems necessary to access them (hence the term Database Management System) will provide you with some important functions usually not available with simple filing systems. These are: minimal or no data redundancy, increased consistency of information, increased data security, development of data independent application programs, and centralized data control. However, database systems are not the rose garden many expect them to be. Having a centralized data location can make the system a convenient target for destruction. In addition, an integrated data system could easily result in loss of responsibility for data accuracy. Who updates the NAME and ADDRESS fields and who is responsible for the PRODUCT TYPE field? These drawbacks can make a centralized database system unsuitable for a small business environment.

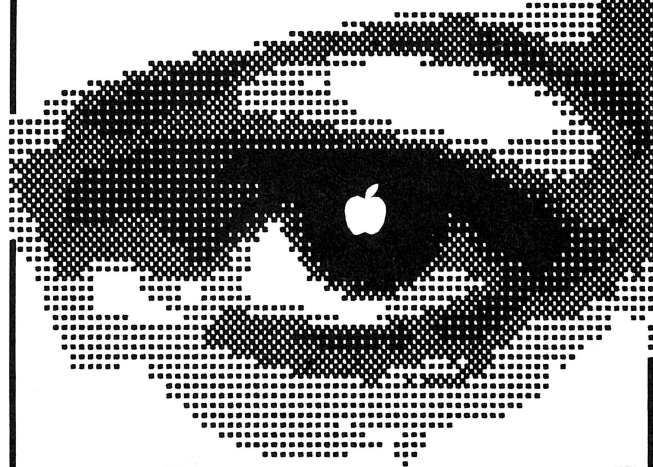
It should be obvious that automating your filing reporting functions can require more than a simple reading of the ads. In future articles and in activities of the Data Management Special Interest Group of the International Apple Core, we will explore the various database structures and the systems that access them and attempt to point out how they might be of use to you and your business.

If you would like to join us, please write. My address is:

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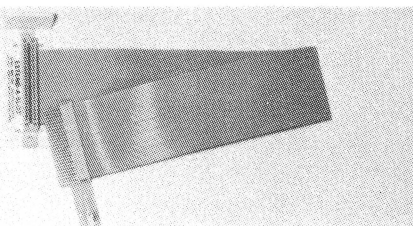


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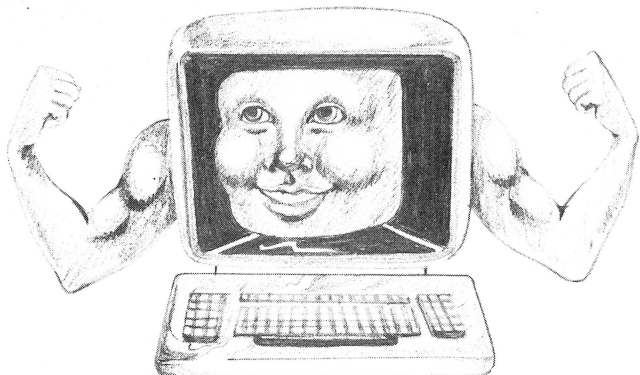
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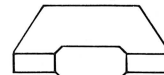
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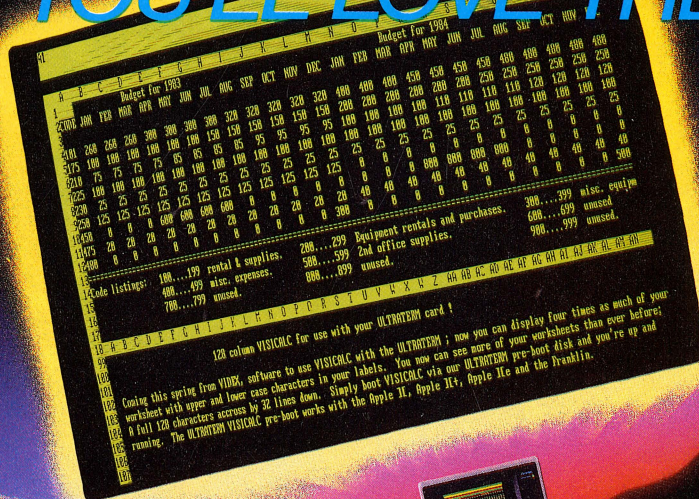


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200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200
100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75
25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
125	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
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# Plot and Counterplot

by Peter C. Weiglin

**H**ewlett-Packard's Model 7470A two-pen plotter has a new big brother: the 6-pen Model 7475A, which lists for \$1,895.

Meanwhile, H-P has also announced a 30 per cent price reduction on its Model 7470A, from \$1,575 to \$1,095, and new film for overhead transparencies.

The picture at the left and the sample graph save much space in describing the Hi-Res capability of the 7475A plotter.

The 7475A contains a carousel containing six pens from which the plotter may select (software or panel controls) during a plotting operation; the 7470A carries two pens. In terms of drawing size, the 7470 is limited to ANSI "A" size drawings (8 1/2 x 11"). The 7475A can work on these and ANSI "B" size drawings as well (11 x 17").

Both plotters also handle overhead transparency film, and H-P also announced a new film that dries in 30 seconds, rather than the old ten minutes.

Both plotters use essentially the same pen transport mechanism; H-P is deservedly proud of its DC servomotor drive (not stepper motors), which allows them to claim a .001" resolution and pen speeds up to 15 inches per second. Another nice feature: when a pen is returned to the carousel, a cap moves up to cover the point and retard the drying-out process.

The plotters are available with one or the other (but not both) of two interfaces: RS-232C or HP-1B, which is H-P's version of IEEE 488.

It seems clear that H-P is aiming the 7475A toward business users; six pens on-line would, for example, provide three colors in each of two available line widths, or six colors, or any combination. The 7470A becomes an even more "personal" plotter at its new price, for those who don't mind changing pens in mid-plot if necessary.

The plotters work with a wide range of graphics software. A list of software packages for the Apple IIe and III with which either the 7470A or 7475A, or both, are compatible, includes Apple Business Graphics™, Chart-Master™, Graph'n'Calc™, GraphPower™, and pfs®:GRAPH. Craig Schmidt, H-P's Product Marketing Manager for these two plotters, explained that, as usual, the first list is already outdated. A number of firms have been working with H-P to

allow their software to work with the 7475A, and more announcements are forthcoming.

For those who do their own programming, the 7475A contains more than 50 Hewlett-Packard Graphics Language (HP-GL) commands covering pen movement, character selection, area fill and scaling.

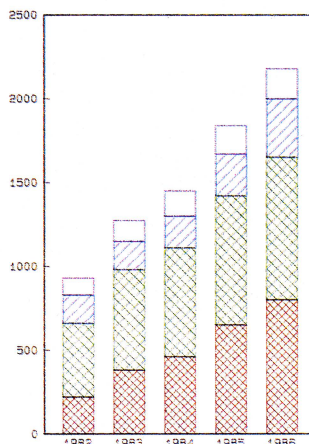
## New Apple Plotter

Apple Computer, meanwhile, has announced its Model 410 four-pen Color Plotter, which will accommodate B-size drawings, has an .004-inch resolution, and will sell for \$995. The plotting speed is about one-quarter as fast as the Hewlett-Packard units. Apple is apparently using the Yokogawa Electric Works (YEW) PL-1000 mechanism with some Apple-modified electronics.

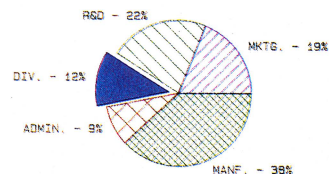


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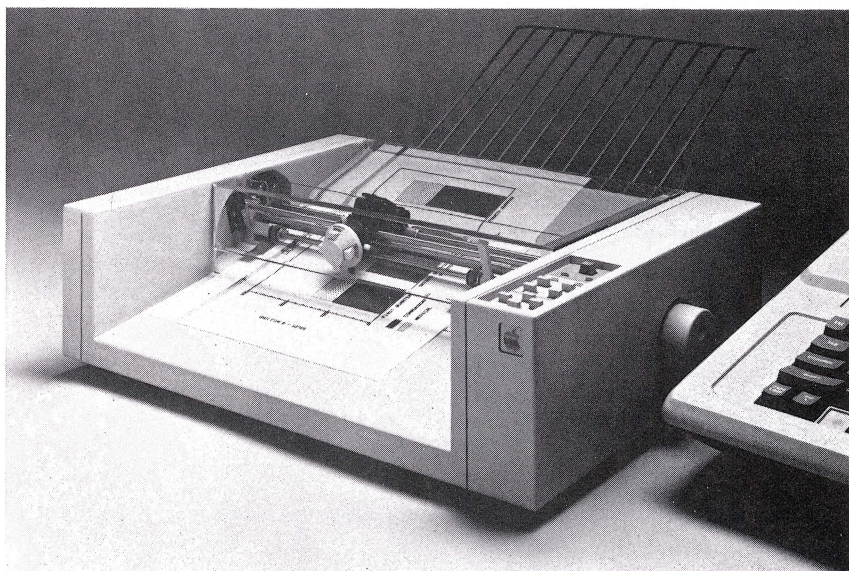
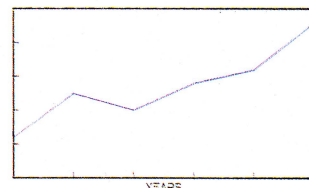
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# The Incredible Jack

*Review by Barry D. Bayer*

Published by:

Business Solutions Inc.

Machine: Apple II, II Plus (with 64K), //e

Language: Run Time Pascal

Price: \$179.00 (\$20 for backup disk, \$30 per year for telephone customer support)

**T**he *Incredible Jack* purports to be a "Jack-of-all-trades" which combines word processing, calculating and record filing functions into one integrated program with a single set of commands, all dealing with a single file. And in one small sense it does that. A representative of the publisher told me that *Jack* was designed for educators and beginning //e users. It might be adequate for that audience. But if you read the advertisements or the articles, you may have concluded that *Jack* is the Apple // answer to *Lisa* or *1-2-3* or *VisiON*. Well don't throw away your *VisiCalc*, *DBMaster* and *Applewriter* just yet. Because while *Jack* performs all of these functions after a fashion, it doesn't do any of them in a way that will satisfy the journeyman Apple user. Let's take a look at the details.

*Jack* comes packed in one of those \$3.00 plastic cases which can hold 10 mini-floppies, together with a 125 page 5-inch square manual. The manual is divided about half and half between tutorial and reference guide. The manual is informative as far as it goes, but the publisher's spokesman told me that *Jack* was so powerful that the manual documented only about one third of *Jack's* capabilities. (I'm not sure why, but he seemed rather proud of this.)

## Description

*Jack* is a run time Pascal package with all of the pluses and minuses that implies. If you don't have an 80 column card, you can utilize 80 columns with Pascal's Control-A, Control-Z arrangement, and can show upper case in reverse video, with lower case in regular capitals. The standard shift key modification for the Apple II is recognized, and Control-E will change cases if your shift key won't. Non-standard interface cards such as the Mountain Computer CPS Multi-function card will not work unless you fiddle with the BIOS in some way, but you CPS card users are undoubtedly familiar with such problems and know how to solve them. And of course, *Jack* will not read normal DOS files, nor will it generate files readable by a DOS based program. (Of course, Pascal/DOS transfer programs HUFFIN and PUFFIN will solve some of these problems for you.) The publisher claims that the program takes advantage of the //e's new features. As I reviewed *Jack* on a II, however, I couldn't say.

## Use

Boot the disk, and you are eventually presented with an across-the-top of the screen menu that, in typical Pascal menu style, can be accessed with the first letter of Disk, File, Select, or Print. (In typical Bayer fashion I found myself hitting the wrong key from time to time, but I was always able to back out to the main menu

without disturbing anything. I used to have that problem with Pascal, also, but got used to it. I assume I'd get used to *Jack* after a while, also.) The D option leads to a display of file names present on the data disk (by the way, you really need a minimum of two disk drives to use the program effectively). Simply move the cursor to the appropriate file name, and hit the Load option on the new menu that has suddenly appeared, and the file of your choice will be "loaded". If you want to start a new file, enter a name and load it. This step is important, because although *Jack* will let you work on an unnamed file, you won't be able to save it, print it, or do anything else with it.

To use the "word processing" portion of *Jack*, simply "Preset" left and right margins, if applicable, and start typing. *Jack* does an automatic word wrap when you get to the end of the line, and what you see is what you get. When you are finished typing you can Save the file, or move to the Print mode, and print the file. If you change your mind, you can overstrike any portion of the text, insert, delete, and copy a word or phrase in one section to another section. However *Jack* is missing Search and Replace and many of the other features of the modern word processor. I wouldn't want to type this review using *Jack*. But if I had a bunch of individualized form letters, I might use *Jack*. Which bring us to the information manager portion of the program, using a mailing list as an example.



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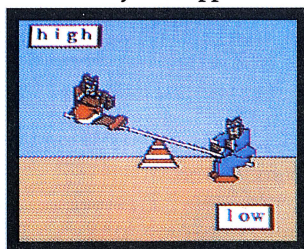
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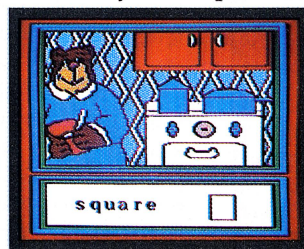


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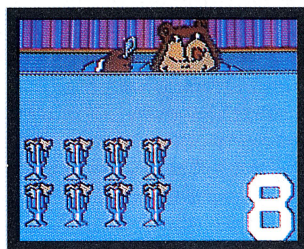
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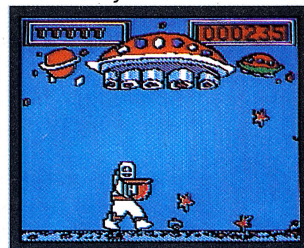


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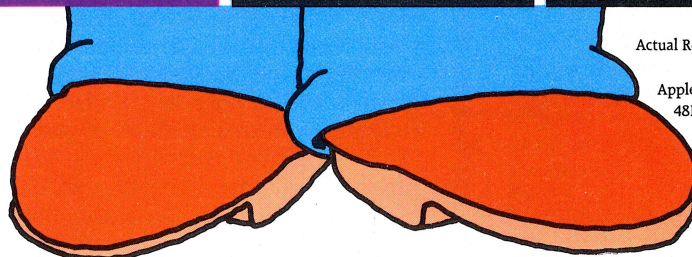
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A/M13-S5



Enter a colon (":") and a caret (" ") with some number of spaces (The default setting is 10 spaces.). The distance between the colon and the caret is considered a field. Position the cursor somewhere within the field, press a Control-F, and the cursor will jump down to the "Footnote" area of the screen which looks something like:

#01:

Had there been text of some sort immediately to the left of the colon on the text page, that text will be associated as the name of the field on the Footnote page. Thus if instead of typing just a colon, you had typed "Dear:", the Footnote area of the page would now show:

DEAR:

*Jack* is now asking you to enter a rule of some sort which will tell it how to deal with the field called #01, or DEAR. This "rule" could be a local format for the entries that will be made in that Field, or a Formula of some sort, or even a constant. In this case, we might want to leave the Footnote blank, because we want to pick the DEAR names off of a mailing list. As a matter of fact, because the name we want to insert into DEAR will be associated with a field named FIRST.NAME in the mailing list file, we should also go back into the Footnote, and overstrike DEAR: and change it to FIRST.NAME. Other fields of the Addressbook file might be included, so that each addressee's city could be within the body of the letter. Again, the place in the form letter where the city is desired would be indicated with a colon and a caret and would be "named" within the Footnote, with the same name as the field in the Addressbook file.

Now Addressbook would be "copied" into the form letter, and all of the information contained in fields with a common name between the two files would be copied from the one to the other. Fields in Addressbook which did not have counterparts in the form letter would be ignored. Formletter (actually, one formletter for each name in Addressbook) would be printed.

Printing has a page of parameters which is shown in Figure 1. Any of these may be changed. When the parameters are properly set, *Jack* will print out each record, each on the top of a new page.

A *Jack* page can take a different form, because a Footnote can also contain a "calc" rule. You can define a field

RETAIL

and a field called

DISCOUNT:

DISCOUNT can be associated with a Footnote which says

.35 \* RETAIL

Finally, a field called

WHOLESALE:

can be defined as

RETAIL - DISCOUNT

Place a number in RETAIL and the DISCOUNT and WHOLESALE price will appear. This is the basis of *Jack's* claim to be a calculator.

Calculating rules can be more complicated. DISCOUNT, for example, could have a rule which says

```
IF RETAIL > 1000 THEN .6 * RETAIL
ELSE IF RETAIL > 500 THEN .5 * RETAIL
ELSE IF RETAIL < 100 THEN .7 * RETAIL
ELSE .75 * RETAIL
```

It is important to note, however, that *Jack* is not VisiCalc. A Business Solutions spokesman agreed with me by telephone that *Jack* does not do a very good job on "Row and Column" type Templates. A major reason is the lack of a Replicate command. Calc users know that one of the most important parts of a spreadsheet program is the ability to enter a command which says this month is just like last month. And so on for the rest of the year. If you wanted to do something like that with *Jack* you would have to enter twelve Footnotes (which could be done without retyping with the "copy" command) and then change the reference names in each command to refer to the correct previous rule. This is not something that you will wish to do very often.

We have touched upon the information manager section of *Jack*, and by now you will not be surprised to find that a file format can be set up by entering a field name, a colon, and then adjusting the caret the appropriate number of spaces to the right of the colon. *Jack* apparently maintains a table of some sort of one field per record for sorting and selecting purposes. This primary field is the first one to be designed into the record. This is not necessarily the first field physically appearing in the file. Thus it is possible to keep the primary sort by zipcode, yet have the last name appear as the first field in each record. Editing a form is as simple as editing a letter. What you see is what you get. And, of course, calculated fields may be included as part of the form, simply by entering a "rule". In *Jack's* favor, setting up an entry form for an Addressbook type file, as shown in Figure 2, took about 3 minutes.

Once the form is set up, the format should be "Locked" and "Saved", and is then ready for data entry. You can tab from field to field, entering data as appropriate, then "save" the record to disk, and move to enter the next record. Ninety names (or presumably 190 names) go into the address book very quickly.

One can "select" to find a record containing particular information within any field. The process is as easy as entering a Footnote, equating the field name with some particular contents. Thus

LAST.NAME = "BAYER"

would find all records which have the name BAYER as a last name. (Watch upper/lower case, though, because *Jack* does not recognize "BAYER" and "Bayer" as the same string.) If LAST.NAME was the first field entered into the form, *Jack* will find the selected records fairly quickly. If not, *Jack* will have to read through each record to see if LAST.NAME = "BAYER" and this could take quite a while.

But although I expect to find all of the information in Addressbook useful eventually, for my own purposes, I would like to have a list with last name, first name, area code, and phone number on a line, fifty lines to a page with appropriate headers and footers. A pretty standard report printout.

The first thing to do is to set up another file, which I'll call PHONELIST, with the field names FIRST.NAME, LAST.NAME, A.CODE and PHONE. Note that these names are the same field names used in Addressbook. Now copy Addressbook to Phonelist; *Jack* will read each record in Addressbook, and transfer the information in the four indicated fields in the appropriate fields in Phonelist. If Addressbook has 93 records, Phonelist will also have 93 records.

Now to print out the list, in alphabetical order, (with my cousin Andrew, brother Charlie, niece Emily, all with the same last name in Andrew-Charlie-Emily order), 50 to the page. Now I happen to think that this is a perfectly ordinary request to make of *Jack*. Unfortunately, *Jack* can't do it.

*Jack* can sort on any given field, but cannot do a secondary sort. All of the Bayers will be together, but *Jack* doesn't really have a way to make sure that Charlie will appear after Andrew and before Emily. Second, *Jack* wants to start each record on the top of a new page. One record, at least one page. Of course, that's not what I want. Business Solutions suggested that one way to solve the problem would be to cheat, telling *Jack* that each page was only one line long.



```

WIDTH(255): 80      LENGTH: 66
SPACING: 1          LEFT OFFEST: 0
FILL(Y/N): Y         FLUSH-RIGHT(Y/N): Y
COLON(B/D/): :      CARET(B/D/^): ^

TOP SKIP: 2          BOTTOM SKIP: 3
TOP TITLE:
BOT TITLE:

FOOTNTES(Y/N/E): N

LINEFEED(Y/N): Y     CONTINUOUS(Y/N): N
MESSAGE:

SORT:
ALPHA SORT(Y/N): Y

```

Figure 1

```

LAST.NAME:           ^
FIRST.NAME:          ^
COMPANY:              ^
ADDRESS:              ^
CITY:                 ^
STATE: ^ZIP:          ^ AREA.CODE: ^
PHONE NUMBER:        ^ STATUS: ^
OTHER.NUMBER:         ^

```

Figure 2

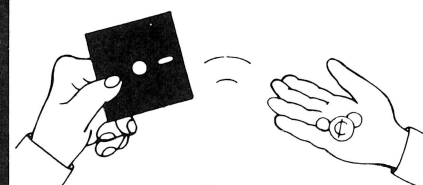
That sort of works, but then *Jack* won't give me headers and footers, and page breaks every 60 lines, where I would like to see them. A Business Solutions representative acknowledged that *Jack* was a little weak on report formatting. While half a loaf is better than none, half a file manager isn't much use at all.

I was able to get my questions about *Jack* answered by calling the company. However, the manual notes that a special telephone "hotline" service is available to registered owners for a fee of \$30 per year. I am not saying that Business Solutions won't talk to you if you haven't paid your \$30, but the manual does suggest writing for answers, and Business Solutions' phone number is nowhere to be found in the manual. I consider Business Solutions' policy a bit strange, particularly after the company's statement that the manual documents only a third of the capabilities of the program. I think the prospective purchaser should consider not only the \$129.95 purchase price but also the \$30 per year hotline fee, as well as the \$20 backup fee in determining whether to purchase the product. (To be fair, I received a coupon good for \$15 off the backup copy fee, but I have no idea whether this is a permanent policy of Business Solutions, as the manual makes no reference to it.)

*The Incredible Jack* is somewhat of an enigma. Business Solutions has presented a nice looking package with convenient user interface, and which could be of real service to a purchaser. The file manager record format setup is the easiest that I have ever seen. Reorganization of file structure is not the problem that it seems to be with some programs, and form letters with calculated fields work about as easily as any other program I've used for the purpose. But because of the inability to do a secondary sort, and the requirement that each record start on the top of a page, decent summary reports are next to impossible to generate. And as far as I was able to determine from the company, no plans are being made to make changes that would solve the problem.

But the biggest problem with *Jack* is that it is not, as it has been hyped, a do-it-all calc/word processor/file manager. I would think that anyone who buys *Jack* with all three functions in mind will be sorely disappointed. Should Business Solutions figure out how to let the program sort and report, however, the prospective purchaser who wishes an easy to use modest information manager, with a "user friendly" form letter interface could do a lot worse.

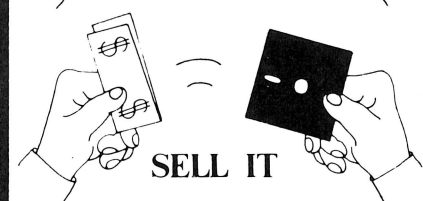
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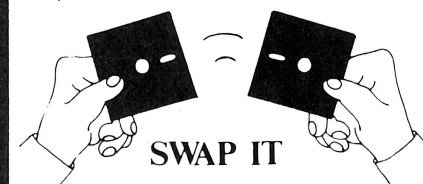
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# A Personal Resource Projection Program

by Joe and Chris Jasper

*(We present here a program the use of which should be made mandatory for all teenagers and politicians. Particularly politicians. Most particularly legislators. Or, maybe if enough voters were familiar with the concepts shown by this program, they would be less susceptible to the rhetoric that clouds sound economic thinking.—PCW)*

**M**OST OF US, while thinking about our financial future, have wondered: "What if—?" What if I left my present job and started my own business or retired early; would my savings (and pension) last as long as I hope they will, or should I wait a few more years? Or, what if I invest some of our savings in a new company with "outstanding potential", and it succeeded - or failed? What if—?

In situations like this, a most important consideration is the amount of money available (both now and in the future) to live on, to invest, to keep in savings, and so forth - in effect, your personal resources. How these resources are used, or misused, can have a substantial effect on your future plans. This program can show the results of various decisions on those resources: what will happen with an increase or decrease in savings, salary, expenses, interest rates and inflation.

## What This Program Can Do

This program allows entry of your present savings or cash-on-hand balance (current resources) plus your present salary or other income, and your anticipated expenses for the year. Your savings balance increases by an estimated interest rate, while your salary and expenses increase by an estimated cost-of-living, or inflation rate. The individual entries and interest/inflation rates can be changed as circumstances change, or can progress at the rates entered earlier.

An example of a typical projection demonstrating what this program can do, is shown in Figure 1, and is calculated as follows:

1. The original entries are made for the year beginning in 1982.
2. Before the 1983 entries are displayed:
  - a. Your original \$10,000 savings balance is increased by the interest rate (8%) to \$10,800.

b. A cost-of-living raise increased your \$20,000 salary by the inflation rate (5%) to \$21,000; unfortunately, that same cost-of-living increased your expenses by 5% to \$26,250. ("What one hand giveth . . .")

c. The entry math section of the program (Lines 300-350) added the increased savings balance and salary together, and subtracted the increased expenses to obtain the new savings balance (\$31,800 - \$26,250 = \$5,500).

3. The newly increased balances are displayed for the beginning of 1983, and if the RETURN button is pressed the process is repeated for 1984. NOTE: To keep the program simple, it is assumed that any money left over at the end of a year is deposited in the savings balance, forming part of the "resources" for the next year.

---

FOR THE YEAR BEGINNING IN: 1982

ESTIMATED SAVINGS BALANCE: \$ 10000

EXPECTED SALARY/OTHER INCOME: \$ 20000

ESTIMATED YEARLY EXPENSES: \$ 25000

EST SAVINGS INT RATE: 8%

EST INFLATION RATE: 5%

FOR THE YEAR BEGINNING IN: 1983

ESTIMATED SAVINGS BALANCE: \$ 5550

EXPECTED SALARY/OTHER INCOME: \$ 21000

ESTIMATED YEARLY EXPENSES: \$ 26250

EST SAVINGS INT RATE: 8%

EST INFLATION RATE: 5%



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FOR THE YEAR BEGINNING IN: 1984  
 ESTIMATED SAVINGS BALANCE: \$ 481  
 EXPECTED SALARY/OTHER INCOME: \$ 22050  
 ESTIMATED YEARLY EXPENSES: \$ 27562  
 EST SAVINGS INT RATE: 8%  
 EST INFLATION RATE: 5%

Figure 1

Some good news in 1985: you receive a New Year's Day gift of \$10,000 from a rich uncle (just in time!), and with this money burning a hole in your pocket, you want to make a \$5,000 down payment on a new car the next day. (Is this a wise thing to do? Let's see.)

Press the space bar to move to the entry changing section of the program, and enter next year's date (1985), the new savings balance of \$10,481 (you'll have to do the addition of the new money yourself), and the revised expenses of \$32,562 (last year's expenses plus the down payment on the new car.) The revised entries will be displayed as before (see Figure 2). Press «RETURN» to see how you'll fare in 1986. Oh, oh—your estimated savings are down to \$281, and you haven't taken car payments into account. To avoid running out of money in 1986, you'll have to get a better job or cut down on your expenses.

FOR THE YEAR BEGINNING IN: 1985  
 ESTIMATED SAVINGS BALANCE: \$ 10481  
 EXPECTED SALARY/OTHER INCOME: \$ 22050  
 ESTIMATED YEARLY EXPENSES: \$ 32562  
 EST SAVINGS INT RATE: 8%  
 EST INFLATION RATE: 5%

FOR THE YEAR BEGINNING IN: 1986  
 ESTIMATED SAVINGS BALANCE: \$ 281  
 EXPECTED SALARY/OTHER INCOME: \$ 23152  
 ESTIMATED YEARLY EXPENSES: \$ 34190  
 EST SAVINGS INT RATE: 8%  
 EST INFLATION RATE: 5%

Figure 2

This somewhat frivolous example showed what your resource trend is: in this case, not good. Perhaps if you had not spent so much on a new car, or had found (and kept) a higher paying job, and/or had managed to cut your expenses, your resources would have been rising instead of falling. In any case, by repeating the projections with different values for the various

entries, you can get a reasonable approximation of what income will be required for a specific goal: putting a son or daughter through college, a new car, a globe-spanning vacation, retirement, or *all* of these!

### Program Operation

Lines 100 - 130: Provide the original value entry points for the beginning year (DT), saving balance at the start of the projection (SB), salary or other income that can be expected for the coming year (SY), expenses or situations that could reduce your resources (EX). The saving interest rate (A) and the inflation rate (B) have an important effect on the projection, especially at rates over 8 - 10%, so make your best estimate of what they are likely to be in the years ahead.

Lines 200 - 260: Display the entry values, and provide the opportunity for changing an incorrect entry, or updating an entry for the next year to reflect a change in your financial situation. NOTE: If your printer interface card is in a slot other than #4, change Line 205 and 335 accordingly. PR#0 (Line 240) turns the printer off after recording the displayed entry values.

Lines 300 - 350: Provide the math functions for the program. Line 300 advances the entry date by one year. Lines 305 - 315 increase the respective entries by the amount of the interest/inflation rates associated with that entry. Line 320 adds the new saving balance value to the salary/other income entry and subtracts expenses to obtain the year end value for the savings (resource) balance. As long as the savings balance is at least one dollar at year end (not much, but something), the yearly displays and calculations can continue if the «RETURN» key is pressed to show another year. If your projected expenses reduce your resources below the point where your income cannot keep up, and your resources will fall below one dollar before the next year's totals are displayed. Lines 330 and 335 signal an end to that set of values and request that you enter new values for another projection.

Lines 400 - 475: This is the entry change section. It is similar to the initial entry section (Lines 100-130) but is structured differently to allow you to retain an existing entry (by pressing the «RETURN» key), or to change an entry (by pressing the space bar). NOTE: If you are planning to change an entry for the following year, be sure to change the date, as the jump to the entry change section by-passed the date changer on Line 300.

### Program Notes

1. CHR\$(13) is the ASCII code equivalent of the «RETURN» key. For example: Line 250 waits for a keyboard entry. If the «RETURN» key is pressed, ASCII code CHR\$(13) is generated which causes the program to jump to Line 300 where the math functions for the next projection begin. If a key other than «RETURN» is pressed, the program jumps to Line 400 and the changing entry section. (Actually *almost* any key other than «RETURN» could be pressed to jump to Line 400, but the space bar was chosen for its accessibility.)
2. The displayed entries for the savings (resource) balance, salary/other income, and expenses, do not show a decimal fraction; this is to increase the clarity of the display. The decimal fraction is retained in the computer memory, however, for use in future calculations. Since the values are estimates anyway, the display will still be valid within one dollar, which is close enough for the purpose.
3. If your expenses and income vary from month to month as they do for almost everyone, an article by this author in a



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previous issue of **Apple Orchard** titled: "A Running Average Program" provides a means of averaging many months or years of varying income and expenses, to show a trend line whose projected values can be used as entries for this program.

4. By entering zeros for salary, expenses, and inflation, and a value such as \$1,000 for the savings balance, you can see the effects of different rates of savings account interest. Or do the same with your salary or expenses and an inflation rate of say 5%. The result, especially after several years have passed, can be staggering.
5. The savings balance entry is a "catch-all" for any resources remaining at the end of each year. If you choose to keep your "left-overs" in cash or some other non-interest earning form, enter 0% for the savings interest rate. If some of your resources earn interest and others do not, enter a proportionate rate for the total value.
6. Because this program does not calculate your income tax and deductions, your salary/other income entry should be entered as take-home salary/other income after taxes. Indeed, *all* the entries and calculations are "ex-tax" and should be considered as such.
7. Instead of entering a *specific* year, you might enter a "1" for the initial year, to see the effect after a given number of years - for example: 5, 10, or 15 years later.
8. We hope that all your close-to-true-life projections will result in a growth in your personal resources, and not display the "dreaded" appearance of Line 335 on your monitor screen: RESOURCES ZERO BEFORE END OF 1986!

#### Listing 1

```

1  REM *****
2  REM * PERSONAL RESOURCE *
3  REM * PROJECTION *
4  REM * BY *
5  REM * JOE & CHRIS JASPER *
6  REM * COPYRIGHT 1983 *
7  REM *****
8  REM
9  REM
100 HOME : VTAB 3: HTAB 5: PRINT
    "PERSONAL RESOURCE PROJECTIO
    N": PRINT : PRINT
105 INPUT "BEGINNING YEAR (EX:19
    82): ";DT: PRINT : PRINT
110 INPUT "ESTIMATED SAVINGS BAL
    ANCE: $ ";SB: PRINT : PRINT
115 INPUT "EST SALARY/OTHER INCO
    ME: $ ";SY: PRINT : PRINT
120 INPUT "ESTIMATED YEARLY EXPE
    NSES: $ ";EX: PRINT : PRINT
125 INPUT "EST SAVINGS INTEREST
    RATE (%): ";A: PRINT : PRINT
130 INPUT "EST INFLATION RATE (%
    ): ";B: PRINT : PRINT
200 HOME : VTAB 5
205 PR# 4: PRINT " "
210 PRINT "FOR THE YEAR BEGINNIN
    G IN: ";DT: PRINT
215 PRINT "ESTIMATED SAVINGS BAL
    ANCE: $ "; INT (SB): PRINT
220 PRINT "EXPECTED SALARY/OTHER
    INCOME: $ "; INT (SY): PRINT

```

```

225 PRINT "ESTIMATED YEARLY EXPE
    NSES: $ "; INT (EX): PRINT
230 PRINT "EST SAVINGS INT RATE:
    ";A; "%": PRINT
235 PRINT "EST INFLATION RATE: "
    ;B; "%": PRINT : PRINT : PRINT
240 PR# 0
245 PRINT TAB( 5)"IF ENTRIES AR
    E OK:PRESS RETURN;": PRINT
250 PRINT TAB( 5)"TO CHANGE ENT
    RY:PRESS SPACE BAR": GET E$
255 IF E$ = CHR$ (13) THEN GOTO
    300
260 IF E$ < > CHR$ (13) THEN GOTO
    400
300 DT = DT + 1
305 SB = SB + (SB * (A / 100))
310 SY = SY + (SY * (B / 100))
315 EX = EX + (EX * (B / 100))
320 SB = (SB + SY) - EX
325 IF SB > = 1 THEN GOTO 200
330 PRINT CHR$ (7); CHR$ (7); CHR$
    (7): REM CHR$(7)=BEEP
335 PR# 4: INVERSE : PRINT TAB(
    4)"RESOURCES ZERO BEFORE END
    OF ";DT - 1; " " : NORMAL
    : PRINT : PR# 0
340 PRINT TAB( 5)"PRESS RETURN
    TO ENTER NEW VALUES": GET N$
345 IF N$ = CHR$ (13) THEN GOTO
    100
350 IF N$ < > CHR$ (13) THEN GOTO
    340
400 HOME : VTAB 5
405 PRINT TAB( 5)"IF ENTRY IS 0
    K: PRESS RETURN;": PRINT
410 PRINT TAB( 5)"TO CHANGE ENT
    RY:PRESS SPACE BAR": PRINT :
    PRINT
415 PRINT : PRINT "BEGINNING YEA
    R: ";DT: GET X$: IF X$ = CHR$
    (13) THEN GOTO 425
420 INPUT DT: PRINT
425 PRINT : PRINT "SAVINGS BALAN
    CE = $ ";SB: GET X$: IF X$ =
    CHR$ (13) THEN GOTO 435
430 INPUT SB: PRINT
435 PRINT : PRINT "EXPECTED SALA
    RY = $ ";SY: GET X$: IF X$ =
    CHR$ (13) THEN GOTO 445
440 INPUT SY: PRINT
445 PRINT : PRINT "ESTIMATED EXP
    ENSES = $ ";EX: GET X$: IF X
    $ = CHR$ (13) THEN GOTO 45
    5
450 INPUT EX: PRINT
455 PRINT : PRINT "EST SAVINGS I
    NT RATE: ";A; "%": GET X$: IF
    X$ = CHR$ (13) THEN GOTO 4
    65
460 INPUT A: PRINT
465 PRINT : PRINT "EST INFLATION
    RATE: ";B; "%": GET X$: IF X
    $ = CHR$ (13) THEN GOTO 47
    5

```



```

470 INPUT B: PRINT
475 GOTO 200
499 END

```

Author's Note: While the preceding article was at Apple Orchard awaiting publication, a visiting computer consultant suggested an interesting programming change.

Lines 410-470 of the original program require that the space bar (or any key other than RETURN) be pressed to make an entry change. If you try to input a new value without pressing the space bar, the first number of the new entry will not be entered.

The suggested modification shown below (Listing 2) changes a revised entry to a value. This has the advantage of allowing the first and any succeeding numbers to be entered without having to press the space bar first. However, if some key other than a number is mistakenly pressed, the value entered will be zero.

An advantage of the original program, involving use of the space bar, is that if a non-number is entered, it will not be accepted, and the prompt "reenter" will appear on the screen.

But choose the version you like best, enter and save it, then run it

#### Listing 2

```

410 PRINT TAB( 5)"TO CHANGE ENT
    RY:ENTER NEW VALUE": PRINT :
    PRINT
415 PRINT : PRINT "BEGINNING YEA
    R: ";DT: INPUT " ";X$: IF X$ <
    > "" THEN DT = VAL (X$)
420 PRINT
425 PRINT : PRINT "SAVINGS BALAN
    CE = $ ";SB: INPUT " ";X$: IF
    X$ < > "" THEN SB = VAL (X
    $)
430 PRINT
435 PRINT : PRINT "EXPECTED SALA
    RY = $ ";SY: INPUT " ";X$: IF
    X$ < > "" THEN SY = VAL (X
    $)
440 PRINT
445 PRINT : PRINT "ESTIMATED EXP
    ENSES = $ ";EX: INPUT " ";X$:
    IF X$ < > "" THEN EX = VAL
    (X$)
450 PRINT
455 PRINT : PRINT "EST SAVINGS I
    NT RATE: ";A; "%": INPUT " ";X
    $: IF X$ < > "" THEN A = VAL
    (X$)
460 PRINT
465 PRINT : PRINT "EST INFLATION
    RATE: ";B; "%": INPUT " ";X$:
    IF X$ < > "" THEN B = VAL
    (X$)
470 PRINT
475 GOTO 200
499 END

```



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# IAC Disks of the Month

*Review by Barry D. Bayer*

**B**ack in the early days of Integer BASIC, (that's the one with the '>' prompt) there were very few commercial programs available for the Apple II. Pioneer programmers, after developing a program of which they were particularly proud, wanted to share it with their fellow 10,000 or 20,000 Apple users. The easiest way to do this was to send the program to Apple, which took the best programs and distributed them free of charge to Apple dealers, who would let end users copy them for a small charge, or no charge at all. (Apple also seems to have hired many of the authors of these programs, but that's another story.)

As Apple Computer, Inc. got bigger, and commercial programs began to crowd each other off the dealers' shelves, contributed software, as an Apple Computer, Inc. function, fell by the wayside. But in the IAC, contributed software still lives.

One of the benefits enjoyed by an Apple Users Group belonging to the International Apple Core is the software, usually in the public domain and therefore legally copyable, usually distributed as the IAC Disk of the Month. DOMs become part of each member club's software library, and are distributed by most member clubs to their members at prices approximating the price of a quality blank disk. In addition, DOMs are available to individuals, and other non-members of the IAC, direct from the IAC at a cost of \$25 per disk plus \$3 per shipment for postage and handling. But we'd rather you join an IAC member club, instead, and get the programs on the DOM from your club. DOM programs mostly originate from members of our member clubs who are kind enough to share their work and ideas with the IAC's 400 plus member clubs.

DOM will be a regular feature in **Apple Orchard**, which will feature the most recent DOM available and, as these things go back a couple of years, an occasional "oldy but goody". We should note that DOMs do not contain, in the main, professional quality documenta-

tion and menus, and tend to crash, a bit, when presented with an unforeseen error. (We are told by the commercial software publishers that complete debugging of a program of any size takes thousands of man hours of work. While all programs are tested and are believed to be accurate, it is obvious that thousands of man hours have not been spent on debugging.) On the other hand, DOM programs are usually copyable, listable, alterable, improvable and generally contain understandable examples of "how to do it".

The March, 1983, DOM is a disk prepared by the IAC's Education Special Interest Group (SIG), and differs a bit from the usual. First of all, it was prepared with the assistance of ABC Software of Sacramento, California and Computer-Advanced Ideas of Berkeley, CA. Second, the disk is almost entirely in compiled Integer BASIC (using Chris Galfo's compiler), and is therefore not easily listable, alterable, etc. But it does have a number of well conceived programs which should find a place in any grade school classroom. Programmers noted on the disk include Tim Aaronson, Ted Cohn, Dave Daughtery, Andy Herzfeld, Ted Perry (our EdSIG chairman), Pete Rowe (of "Game Show" fame), Linda Slovic, Lawrence You, Geoff Zawolkow, and Barry Cole.

Boot the disk, and you will be presented with a distinctive high resolution graphics display which is almost worth the price of the disk. (I'm going to keep the topic secret, but the kids will love it.) Eventually you will get to a menu which will permit the running of nine programs.

BOXES tests for single digit addition and subtraction skills in a way that will please first and second graders.

DRILL is an addition/subtraction/multiplication/division quiz program which has delighted my 8 year old. The user chooses the operation to be tested, the level of difficulty, and the time to be permitted for each question. The program then relentlessly provides problem after problem in the form

$$2 + 7 =$$

and immediately marks the player's response as 'C' or 'X'. At the end of the series, the percentage of 'C' answers is given, and the player is offered the chance to exit or try another series. For children in the process of learning their number facts, a program like this is a necessity. ADRILL is just like DRILL, but adds the complication of signed numbers.


APPLE BARREL and APPLE ARRAY use the same graphics and story requesting the user to enter the number of apples that are harvested and placed into a barrel. In APPLE ARRAY, the Apples are stacked neatly into equal length rows, so that the program is, in reality, a clever multiplication test.

FRED FRACTION tests arithmetic manipulations of fractions, using a very clever animated graphics scene to draw the user into the program. Some teacher might not like the program's habit of accepting 13/12 in addition to 1 1/12, but the kids will love it.

MAKING CHANGE uses Hi-Res graphics representations of dollar bills, quarters, dimes, nickles and pennies, and quizzes the player with appropriate change problems. Some cashiers I know could use a bit of training with this.

XZONE is the last game on the disk. A 19 by 19 grid is presented. Using coordinates from 0,0 in the lower left, to 19,19 in the upper right, the player is invited to inspect the grid cell by cell, and determine where two secret (undisplayed) lines intersect. This will keep the older kids entranced for quite a while.

The final program on the disk is not a game, but a program which converts the Apple into a sort of oscilloscope, displaying the "voice print" of sound input into the Apple through the cassette input port. The instructions say it is for use in speech therapy, but it also presents some good clean fun.

Once again, DOM 24 is available from the IAC direct at a high outrageous price. But we'd rather you pick it up from your local Apple User Group. 



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# The Machine Language Disk

## DOM #25

by Barry D. Bayer

**S**illy Question: "What is the most powerful language available for the Apple II?"  
Programmer's Answer: "Machine Language."

Now I am sure that most of you don't really believe the programmer's answer, but it seems to be true that you can do, in machine language, whatever can be done on the Apple in *any* programming language. In addition your machine language program would probably be more compact, and certainly run faster than anything you might do in BASIC, Forth, Pascal, or whatever else.

But machine language is difficult! You have to purchase expensive Assemblers to use it, and who can work in an environment where  $(10 - 1 = F)$ ?

Well, DOM 25 to the rescue. Thanks to L.O.G.I.C., (the Loyal Ontario Group Interested in Computers; it's amazing what a little trademark tiff will drive people to) IAC Disk of the Month Number 25 gives the answers to 90 percent of what you ever wanted to know about machine language, but were afraid to ask. DOM 25 will not convert you to an accomplished machine language programmer overnight, but it will give you the tools necessary to begin work on a machine language level. And even if you never write a second machine language program in your life, (because Bruce Tognazinni will lead you by the hand in writing your first) you will gain new insight into those long listings that appear from time to time in the **Apple Orchard** and other magazines.

The first series of programs falls under the general heading of Binary Entry Utility, written by Kenneth S. Lind. (Binary entry is really a misnomer for Hexadecimal Entry, but why quibble?) Mr. Lind's programs make it easy to enter those strings of hexadecimal numbers that look like

```
100 - 01 2C EA 80 32 C5 A0 AD
```

Sure, you can do them directly from the monitor (you remember, CALL-151, and a \* prompt) without BEU, but if you've ever gotten lost in a multi-line listing, you'll appreciate it.

One step up from BEU is the Mini-Assembler program. You history buffs know that the Mini-Assembler originally resided in the original F8 Monitor, and could be accessed by typing F and

G with the *number of the beast* in between. (I can authoritatively report, however, that rumors that Woz invented FORTRAN using the Mini-Assembler are definitely untrue.)

Unfortunately, the Mini-Assembler never made it to the auto-start Monitor ROM. DOM 25 fills the void with a version which may be loaded into your Applesoft Apple II Plus, as well as instructions as to how to use it. In addition, Bruce Tognazinni takes you on a short tour of machine language programming, and shows you how to write a real live program. (Yes, you will actually write a machine language program before you're finished.) Hopefully, Bruce will enable you to overcome your "Fear of Monitor".

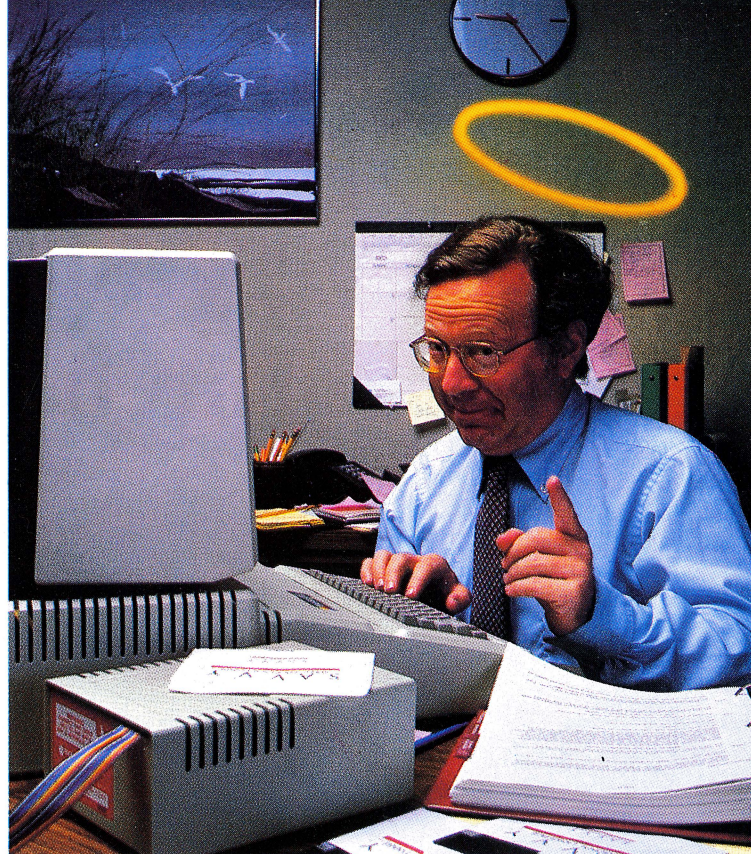
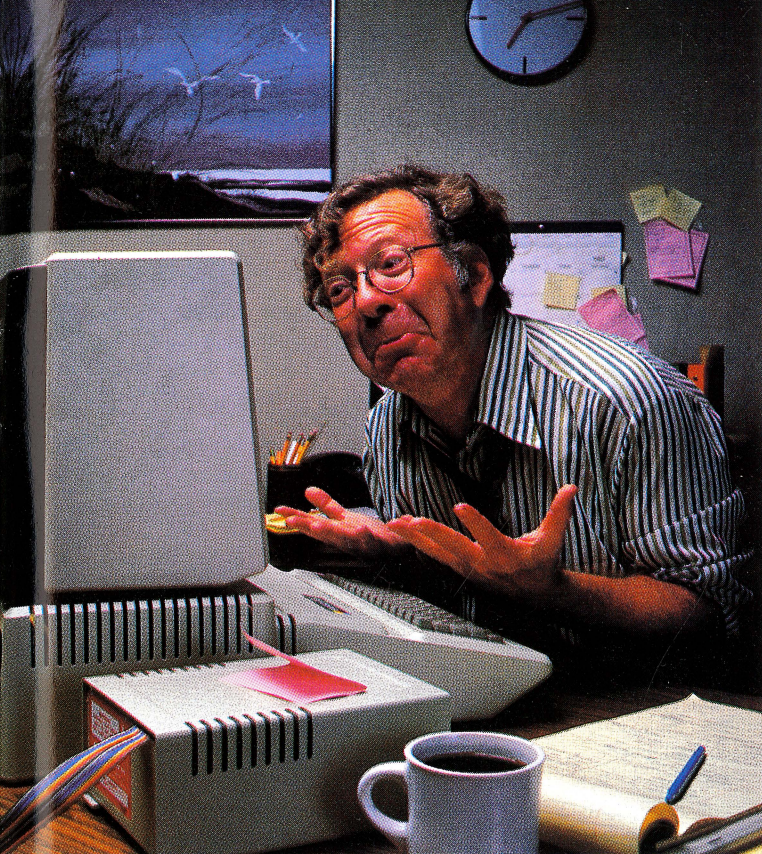
The Mini-Assembler, though often better than entering Hex numbers, is not meant for extensive programming. Editing is difficult and you cannot make copies of the assembler "source code". For real machine language work you need a real Assembler. And DOM 25 has a series of programs revolving around the MASM ASSEMBLER. Now there is a lot that MASM does not do, and anyone who is about to embark on a career as a machine language programmer would do well to spend \$100 or so and purchase a full blown macro assembler with all sorts of bells and whistles. A logical step from MASM is to the commercial S-C Macroassembler. But for those of you just getting started (and who never expect to have more than a gentleman's interest in the process) MASM should work, and the price is certainly right.

A Machine Language Tutorial by Tom O'Brien of the Green Apples in Cedar Falls, Iowa is the last major section on the DOM. The Tutorial will not make you a machine language programmer, but working through O'Brien's examples, and carefully reading through his material will teach you quite a bit about how your Apple, and its 6502 microprocessor work. Other programs on DOM 25 include  
ALL PURPOSE DISASSEMBLER  
BFILE LIST  
MEM/DUMP TO TEXT FILE  
MEMORY INTERPRETER

All in all, DOM 25 is quite a bargain. Get it from your IAC member club.







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# Everything But the Kitchen Sink

*Review by Joyce Conklin*

Introduction to BASIC Programming  
by Gary B. Shelly and Thomas J. Cashman  
Anaheim Publishing Co.  
2632 Saturn St., Brea, CA 92621  
\$16.95

There are many factors to be considered when selecting a textbook for use in the public schools. Unlike textbooks for university students, the school system rather than the student pays for the text. More attention is paid to whether the text has a reading level appropriate to the designated user group. If the teacher does not feel comfortable with the book, the correlation of the textbook with the course is likely to be perfunctory at best; perhaps the only reason for issuing the text is so that the students feel that they have a "crutch", but the actual material covered is almost exclusively from the lecture notes. Because computer texts are usually soft-cover, they can't serve as door-stops as I'm sure that some of today's hard-cover texts are utilized! When you find a text that fits your method of teaching, which has attractive printing to encourage the students to read it, and which comes with excellent and detailed support material, the only thing holding you back would be the tight purse strings of the financial officer.

Shelly and Cashman have produced a beginners' text in BASIC programming that answers almost all of the items on my "want-list" for a good text. It is written for use by college level students, but with a small amount of adapting can also be used for high school students. The appearance is very enticing, with four-color separations throughout. Each chapter has its own "color tone", with all illustrations being done in shades of one hue.

This aspect is credited in the acknowledgements to Marilyn Martin, who has done an outstanding job. Also deserving credit for the layout and drawings is Michael Broussard. The illustrations of program segments have a consistent use of shapes and symbols, which serves to reinforce the learning that has occurred in previous chapters.

The reading level of the text is approximately 8th grade, with some few passages going to 9-1/2 or 10. The sequence of material is not all that different from most beginning texts, but the execution is greatly improved over most others that have crossed my desk during this year. The "obligatory" first chapter includes a definition of data processing terms, but also discusses the "philosophy" of programming design. Given the "wrinkled nose" attitude toward flowcharting which is current among many in the computer field, the authors mention it briefly and just use it from then on as if it were the natural method! Included in the first chapter is a discussion of Program Reviews, a means of peer evaluation of programs at each step from conceptualizing to execution. To quote from the Instructor's Guide:

An important element when writing a computer program is the philosophy with which the programmer approaches the task. The correct philosophy is to write a computer program expecting the program to work properly the first time it is entered and executed on the computer system. «To view» the programming

task as a naturally error-prone activity... is incorrect and should never be presented to the students.... The purpose of a program review... is to «insure» that any errors which have been made will be caught in the early stages of program development.

Subsequent chapters cover INPUT/-OUTPUT PROGRAMMING (statement numbers, REMarks, READ and DATA, GOTO); ARITHMETIC OPERATIONS (PRINT using, report editing, TAB, print zones using commas and semicolons); COMPARING (IF... THEN... ELSE, relational operators, strings vs. numeric values, flowchart for decisions, nested IF... THEN... ELSE, tracing program steps, STOP, CONT); LOOPING - INTERACTIVE PROGRAMMING (INPUT, FOR... NEXT, step incrementing - positive and negative, multiple input variables); ARRAYS (creating, loading, multiple arrays, RESTORE, multidimensional arrays, menus, ON... GOTO, GOSUB, ON... GOSUB, sorting); STRING processing (INKEY\$, VAL, LEN, STR\$, LEFT\$, MID\$, RIGHT\$, searching for a substring, STRING\$, ASCII code, CHR\$, ASC); and finally FILES, REPORT GENERATION, AND FUNCTIONS (OPEN, CLOSE, RND, SQR, DEF FN).

While you can see that from the standpoint of Applesoft BASIC, some of the material is available only through patches (PRINT USING, IF... THEN... ELSE) or through translation (GET for INKEY\$, STR\$ statement instead of STRING\$) these are minor items, and may even serve as a springboard for the discussion



of the differences between different BASIC "dialects". There are detailed summaries at the end of each chapter, questions and exercises which do not require program coding, debugging and programming exercises, and supplemental programs. The programs have a business-related tone, rather than a strictly mathematical one. Anyone desiring to use computer programs with a strictly mathematical bent will need to obtain them from another source.

In addition to the text there are three support manuals, which far out-perform anything that I have seen recently in any area, let alone the "hop-on-the-bandwagon" field of computer texts. The Instructor's Guide and Answer Manual includes detailed lesson plans, down to the suggested time required for each activity. While the timing is made to fit 54 lecture hours (a standard college semester) plus programming time outside of the class, with a little thought it could be adapted to the 85-90 class hours of a high school semester. Looking at the suggested time requirements for some of the programs, you are forewarned and can warn your students. The early programs require 1-2 hours from design to entering and execution; later programs require 13-19 hours, or in the case of the files

program, 15-21 hours! Perhaps such a problem could be divided if assigned to high school students. Also included are answers to all the questions, exercises, and program debugging exercises as a part of the chapter outline. In a separate section of the Answer Manual are suggested solutions to all the programming exercises.

Completing the set of materials is a Test Bank with True/False and Multiple Choice questions, and a set of Transparency Masters which reproduce all the drawings (but not the photographs) in the text. There are 100 T/F and 50 Multiple Choice questions for each chapter, but since the same material may be covered in different ways by each kind of question, the authors suggest that the instructor use a carefully designed test, rather than a random question generator. The use of these ancillary materials will greatly reduce the load on the instructor, especially one who is teaching the class for the first time. I am very favorably impressed with this entire set of materials. It would be positively revolutionary and, I am sure, greeted with joy by all if Shelly and Cashman could transfer their knowledge and philosophy to those who are responsible for writing the manuals that come with software products.

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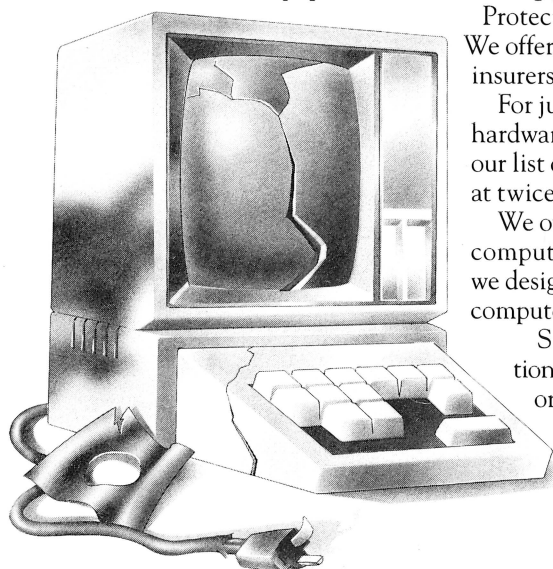
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# The Documenter

*Review by Woody Liswood*

Published by:  
P80NUT SOFTWARE, Inc.  
P.O. Box 490  
Lilburn, Ga. 30247  
(404) 469 - 0056  
Price: \$49.95 plus \$1.05 shipping and handling and 4% more  
for Georgia customers.

If you have ever taken a formal, or even not-so-formal, programming or computer course, the instructor probably sounded like a broken record saying: "Document, Document, Documentation, etc. . . ."

This program does just that. It creates a flow chart of your Applesoft program. Then, a list of all your program branches are printed at the end.

## How it Works

You load your program, put the Documenter disk in the drive, then BRUN DOC. The program then asks you for the slot number of your printer if you wish to use a printer, or an "0" if you wish to use the screen. It then asks whether you have a serial or parallel interface, and whether you would like "Auto Print". Auto-print gives you a continuous screen display when you select Slot #0. Next you are asked if you would like "Stacked Statements". A "Yes" here places your entire program line within a box, even if you have multiple statements in your program line all separated by a ":". A "No" here unpacks the line and puts each statement in a separate box.

## That's it.

I tested the Documenter on a couple of different programs. Since the printouts are quite lengthy, I will use a sample program that was in an ad for the program. My tests show that this is a very, very slow program. You should start up your program, then go out for dinner. A one page BASIC listing that I use to drive a Grappler board took almost 20 minutes to list. The technique is to load the text screen with the flowchart, then dump the text screen to the printer.

The program comes with a one page documentation sheet. It tells you everything you need to know to run the program.

This is a very special program. If you have a need to document your programming efforts this is a very fancy program. It works. It does what it says it is going to do. Look at the listings. I haven't seen any other program advertised which could do this.

## The Sample Program

```
100 INPUT "DO YOU WANT A COPY OF THE DOCUMENT-
    TER (Y/N)";A$
110 IF A$ = "Y" THEN 130
120 PRINT "I CAN'T BELIEVE YOU SAID NO": GOTO 100
130 PRINT "COSTS ONLY $49.95"
140 FOR I = 1 TO 2
150 FOR J = 1 TO 2
160 GOSUB 200
170 NEXT J
180 NEXT I
190 END
200 PRINT "YOU MADE THE RIGHT CHOICE"
210 RETURN
```

```
*****
*   BEGIN                               *
*                                       *
*                                       *
*                                       *
*                                       *
*****

/
/
///////////////////////////////////////////////////
/ INPUT"DO YOU WANT A
/ COPY OF THE DOCUMENT
100 / ER (Y/N)";A$
/
///////////////////////////////////////////////////

/
/
????????????????????
?? IF A$="Y" THEN 130 ??
?                                     ?
?                                     ?00130
??                                  ??
????????????????????
```





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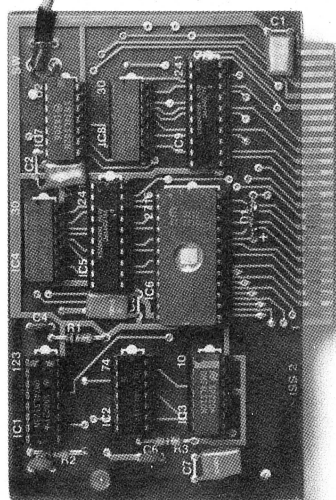
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# Use of the Disk II Interface Card Through Your Own Software

## Part III: Spiral Protection Systems

*by John Uhley*

This is the third article in our series on accessing a disk drive without use of DOS; its purpose is to explain the theory behind spiral copy protection systems, and to create a working protection system of this type. First, though, let's briefly review some of the basic hardware principles of the Apple Disk II.

Inside the Disk II is a special motor used to move the magnetic head back and forth across the surface of a diskette. Figure A illustrates that rotating this motor in a clockwise direction moves the magnetic head towards higher numbered tracks. Conversely, Figure B illustrates that counterclockwise rotation forces the magnetic head towards the lower numbered tracks.

The rotation of the positioning motor is controlled by four phases. These phases can be thought of as electromagnetic poles. By magnetizing and demagnetizing the four poles in a given order the needle can be made to spin in a clockwise or counterclockwise direction. Figure C illustrates that hitting (magnetizing and demagnetizing) poles 0, 1, 2, 3, and finally 0 again will result in clockwise rotation of the needle. Conversely, Figure D illustrates that counterclockwise rotation of the needle is achieved by hitting poles 0, 3, 2, 1, and 0.

By replacing the needle with a motor and the electromagnetic poles with software controlled phases a functional model of the Disk II's positioning motor can be visualized. This is illustrated in Figure E.

The position of the tracks recognized by Apple DOS does not correspond to the phases of the positioning motor in a 1:1 ratio. Instead, the correspondence of DOS tracks to phases is in the ratio of 1:2. The magnetic head is positioned over an even numbered track if the last phase hit was phase 0, and is positioned over an odd numbered track if the last phase hit was phase 2. This is illustrated in Figure F.

If, however, the last phase hit was phase 1 or phase 3, then the magnetic head is positioned over a 'half-track'. Half-tracks are circular regions of data which lie between, and overlap, two adjacent tracks. Figure G illustrates that writing data on two

adjacent phases will result in the destruction of data on one of the phases. The process is similar to painting over an old picture: The initial picture is lost while the new picture remains. Because of the overlapping of phases it is not possible to write full tracks of data on adjacent phases.

Careful observation of this occurrence will show that there is, however, one way to write on adjacent phases without experiencing this overlapping effect. Figure H illustrates that writing small amounts of data while continually positioning the magnetic head will prevent the destruction of data. Because of the spiral shape of the data (as shown in Figure H) this format is often referred to as a "spiral protection system".

The spiral protection system is effective against nibble copiers because data is written on adjacent phases. Most nibble copiers attempt to read in an *entire* track of data before writing that *entire* track of data back onto another diskette. Since these copiers are writing full tracks of data it is impossible for them to write on adjacent phases, and thus they are unable to replicate the spiral format of the original diskette.

The source code of a "human oriented" spiral protection system is listed at the end of this article. Observation of this routine will reveal that most of the code is dedicated towards making the program look "nice". The actual core routines which write data to the diskette occupy only a fraction of the code. The following paragraphs describe the important functional steps which the program executes in order to create a protected diskette.

The first real task of the program is to format the slave diskette and write a bootstrap loader in standard Apple DOS format. When the slave diskette is booted, the Disk II Interface Card will read this loader into memory and execute it. The loader, in turn, will read and execute the file written in spiral format on the diskette.

After writing the bootstrap to the slave diskette the program checks to make sure that the file to be written does not exceed \$1FFF bytes. If this length has not been exceeded the program converts the file from hexadecimal bytes into valid nibbles.



These nibbles are then written out onto the diskette in spiral format using a sector writing routine similar to the one created in Part II of this series (**Apple Orchard**, August 1983).

Before executing the spiral protection program listed at the end of this article be sure to set up the necessary parameters and files. The following checklist should be executed in order to protect a file using this spiral protection program.

#### CHECKLIST FOR EXECUTION

- 1) Load the SPIRAL PROTECTION SYSTEM program at \$0800. Also load the SPIRAL READING program at \$0F00.
- 2) Load the file to be protected at \$2000.
- 3) Store the starting address of the file to be protected (where it should be loaded for execution) in memory locations \$0300 and \$0301 (LSB first).
- 4) Store the length of the file to be protected in memory locations \$0302 and \$0303 (LSB first).
- 5) Store the value to be used as SYNC in memory location \$0304 (Default value \$FF)
- 6) Store the values of the Open Address Marks in memory locations \$0305 through \$0307 in reverse order (Default values \$AF AA D5).
- 7) Store the values of the Close Address Marks in memory locations \$0308 and \$0309 in reverse order (Default values \$B5 D5).
- 8) Execute the program (CALL 2048 from BASIC or 0800G from the Monitor).

NOTE: A 48K machine is required.

Author's Notes: 1. As our custom made DOS occupies page \$08 (e.g. \$0800-\$0900), you will not be able to protect any program making use of that part of the memory. 2. This DOS is not DOS 3.3, but as we stated, a custom made DOS. You will not have the use of the usual DOS commands when booting a diskette protected by this spiral protection scheme. 3. The maximum length of the programs that can be protected by this system is \$1FFF (e.g. the equivalent of a hi-res page).

This article concludes this series on accessing the Disk II without the use of Apple DOS or RWTS. Hopefully it has cleared up some of the mystery regarding how the Disk II can be accessed through your own software. With the materials discussed in these three articles programs which use unique disk operating systems can easily be developed. I hope that this series has been of help to you and welcome any comments which you might have.

#### REMEMBER

It is the side of the floppy disk opposite to the label, e.g. the under-side, which is 'written to' and 'read from' during disk drive operations. Remember this when you lay a disk down on a table surface where it may collect any dust, coffee spills...

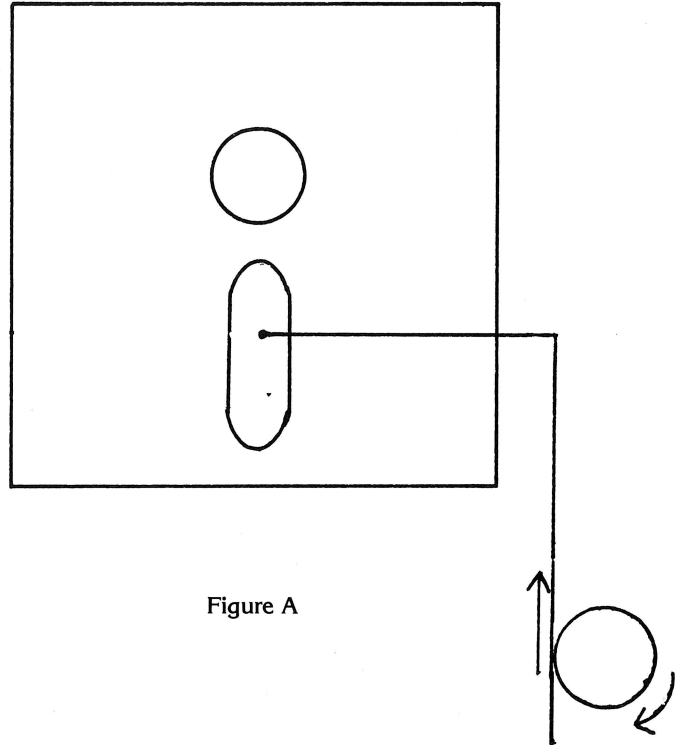


Figure A

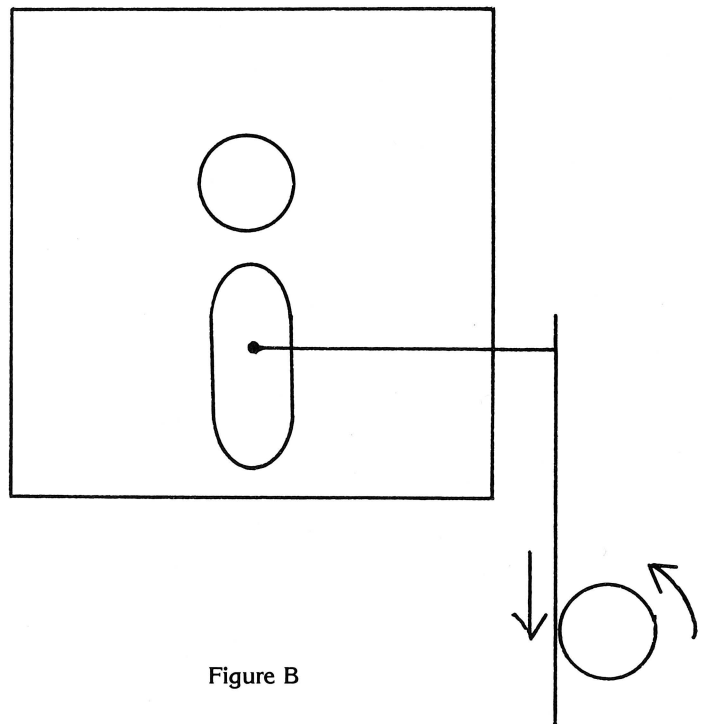


Figure B



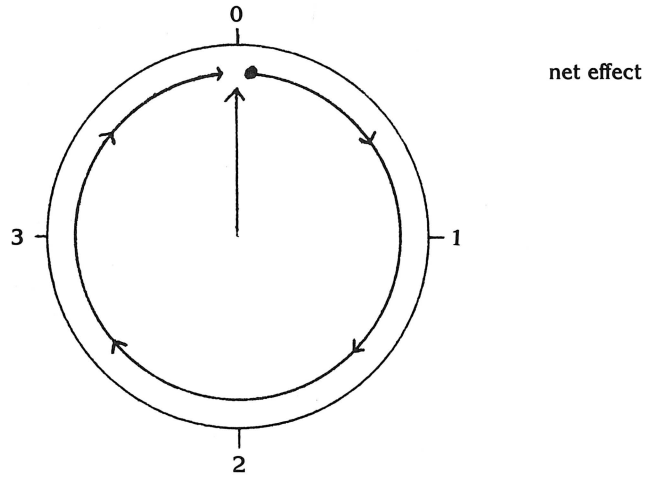
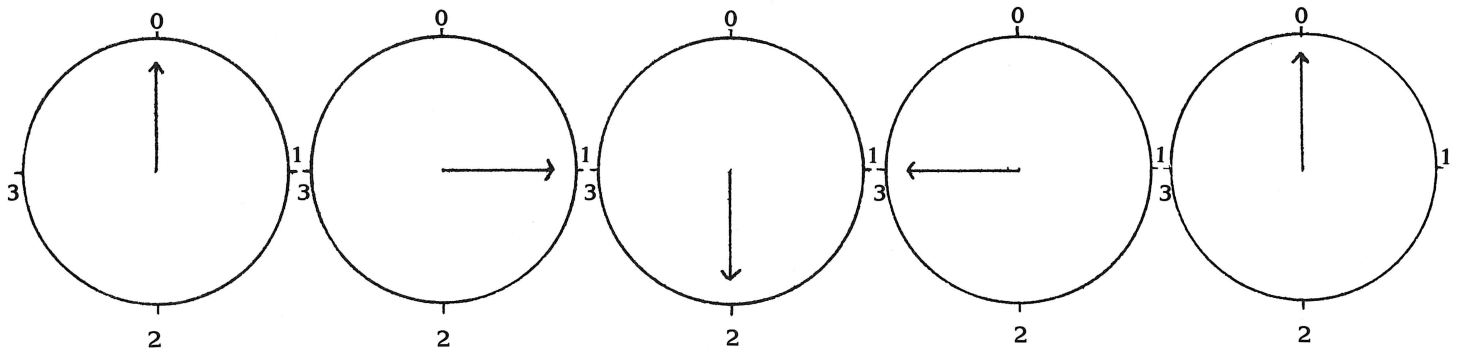


Figure C

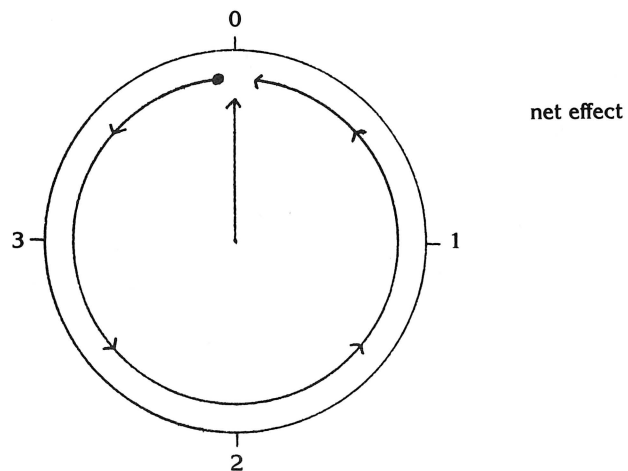
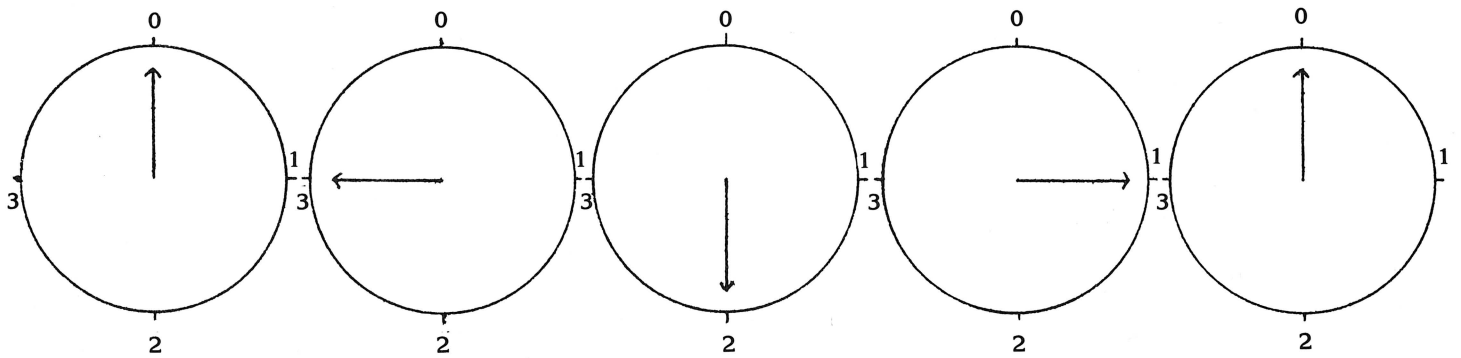


Figure D



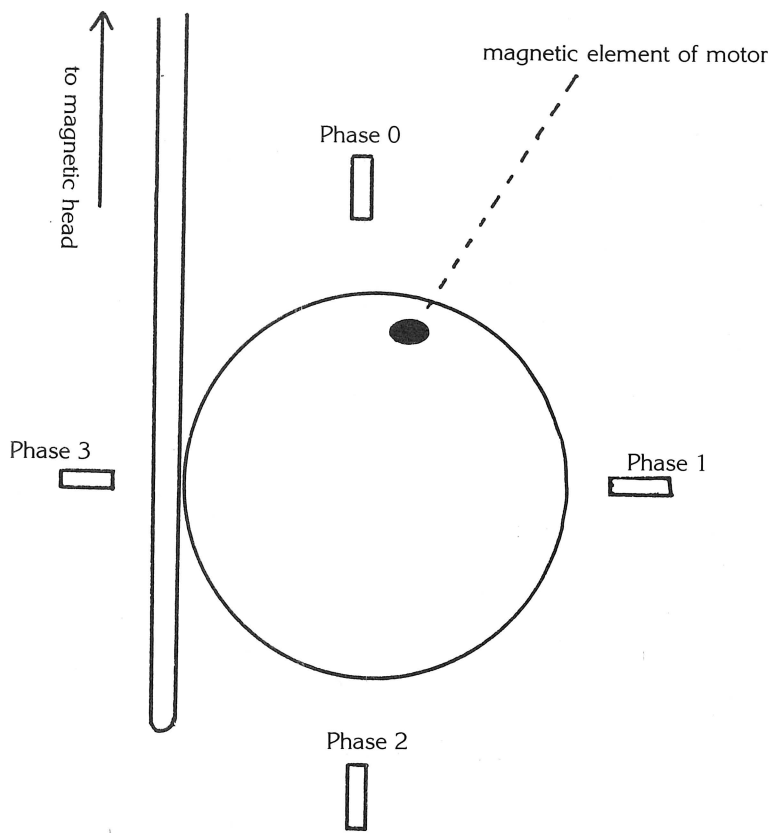


Figure E

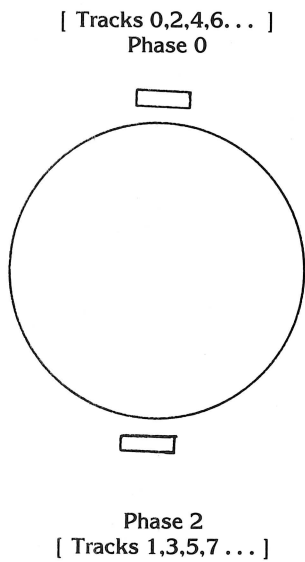


Figure F

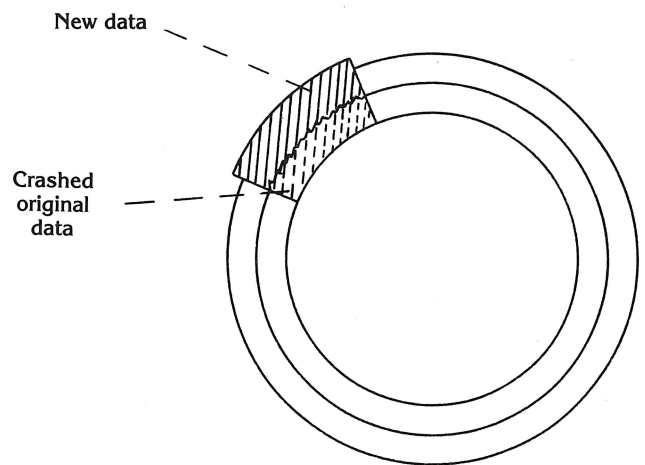
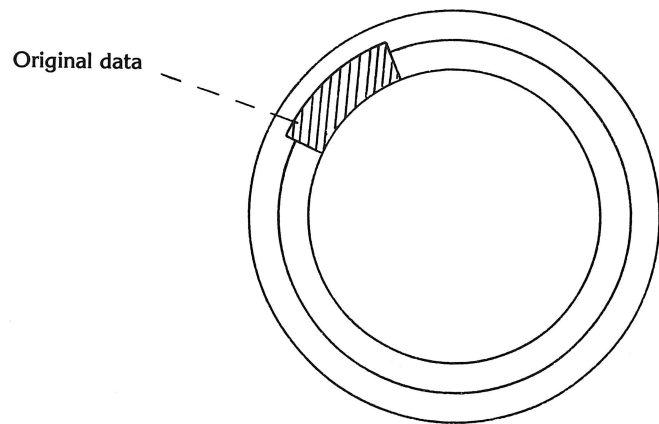
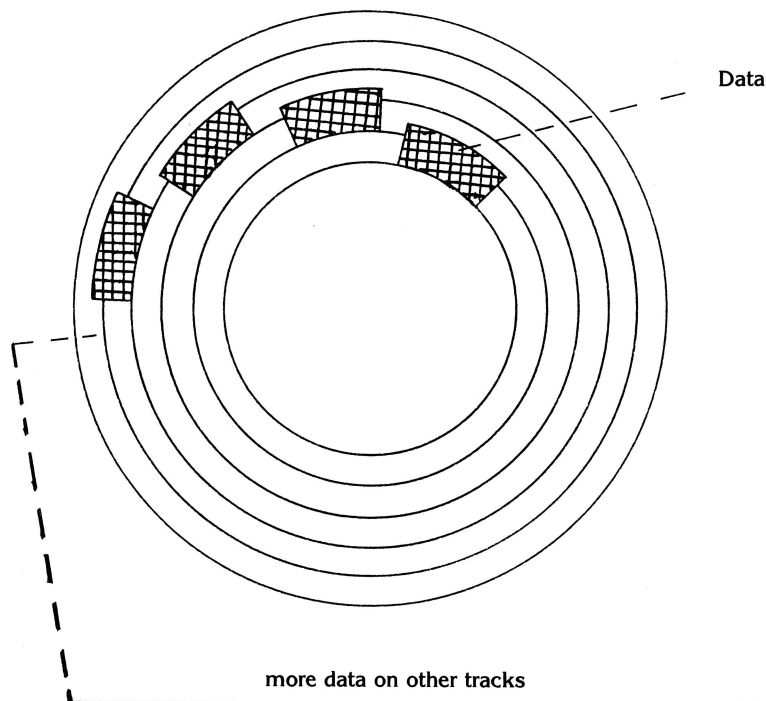


Figure G





"The Spiral"

Figure H

```

#####
# SPIRAL PROTECTION SYSTEM #
#
# CREATED BY JOHN UNLEY #
#
# A COPY OF THIS SOURCE FILE #
# AS WELL AS OTHER SOURCES #
# PRESENTED IN THIS SERIES #
# IS AVAILABLE ON DISKETTE #
#
# SEND CHECK OR MONEY ORDER #
# FOR $25.00 TO: #
#
# NIBBLE SOURCE #
# PO BOX 905 #
# LARKSPUR, CA. 94939 #
#
#####
# BEFORE EXECUTING THE OBJ #
# CODE FOR THIS ROUTINE THE #
# FOLLOWING MUST BE DONE: #
#
# (1) THE FILE TO BE PROT #
# MUST BE BLOADED AT #
# $2000 #
#
# (2) THE STARTING ADDRESS #
#
# OF THE FILE (FOR RUN #
# TIME LOAD) MUST BE #
# STORED IN MEMORY LOC. #
# $300-$301 (LSB FIRST) #
#
# THE LENGTH OF THE FILE #
# MUST BE STORED IN #
# MEMORY LOCATIONS $302 #
# AND $303 (LSB FIRST) #
#
# (3) THE VALUE TO BE USED #
# AS DISK SYNC MUST BE #
# STORED IN MEMORY LOC. #
# $0304 #
#
# DEFAULT: $FF #
#
# (4) THE VALUE'S OF THE #
# OPEN ADDRESS MARKS #
# MUST BE STORED AT #
# MEMORY LOCATIONS #
# $305-$307 (NOTE: STORE #
# IN REVERSE ORDER) #
#
# DEFAULT: $AF AA D5 #
#
# (5) THE VALUE'S OF THE #
# CLOSE ADDRESS MARKS #
# MUST BE STORED IN #
# MEMORY LOCATIONS #
#
# $0308-$0309 (NOTE: #
# STORE IN REVERSE) #
#
# DEFAULT: $B5 D5 #
#
# (6) THE PROTECTION ROUTINE #
# MUST BE EXECUTED #
#
#####
# OBJ $9000 #
# ORG $0800 #
# LST OFF #
#####
# DEFINE THE LABELS USED #
#
#####
SLOT EQU $0000
DRIVE EQU $0001
VTAB EQU $0002
HTAB EQU $0003
BTAB EQU $0004
BASE EQU $0005
BUFFER EQU $0007
BUFFERB EQU $0009
COUNT EQU $000B
COUNTA EQU $000C
TEMPB EQU $000E

```

```

ZERO      EQU    $000F
CURTRK    EQU    $0010
DESTRK    EQU    $0011
START     EQU    $0300
LENGTH    EQU    $0302
SYNC      EQU    $0304
DAM        EQU    $0305
CAM        EQU    $0308
KBGET     EQU    $C000
KBCLR     EQU    $C010
VTABCOM   EQU    $000E
WCOUNT    EQU    $000F
NCOUNT    EQU    $0012
INVTAB    EQU    $0013
GETDOS    EQU    $03E3
GODOS     EQU    $03D9
SPRK      EQU    $C030
ROAM      EQU    $0FF3
RCAM      EQU    $0FF6
RCOUNT    EQU    $0F02
RSTARTA   EQU    $0F1F
RSTARTB   EQU    $0F27
CHECKSUM   EQU    $0310

```

```

*****
*
* DEFINE DISK II CTRL CARD
*
*****

```

```

PHSOFF    EQU    $C080
PHSON     EQU    $C081
DISKOFF   EQU    $C088
DISKON    EQU    $C089
READSW    EQU    $C08C
WRITESW   EQU    $C08D
CLEARSW   EQU    $C08E
SHIFTSW   EQU    $C08F
MONWAIT   EQU    $FCAB

```

```

*****
*
* PRINT THE TITLE PAGE
*
*****

```

```

*****
BEGIN      JSR    HOME
           LDA    #>TITLE
           LDY    #<TITLE
           JSR    PRINTASC

```

```

*****
*
* GET COMMAND AND BRANCH
*
*****

```

```

MAINLOOP   JSR    GETASC
           CMP    #$8D
           BEQ    PROT
           CMP    #$9B
           BNE    MAINLOOP
           JSR    HOME
           RTS

```

```

*****
*
* GET A BLANK INTO DRIVE
*
*****

```

```

PROT        LDA    #VTABCOM
           STA    VTAB
           LDA    #>IMSG
           LDY    #<IMSG
           JSR    PRINTASC
PROTLOOP    JSR    GETASC
           CMP    #$9B
           BEQ    BEGIN
           CMP    #$8D
           BNE    PROTLOOP

```

```

*****
*
* BRANCH TO 3 SUB-SECTIONS
*
*****

```

```

           JSR    CLEARLINE
           LDA    #$00
           JSR    INVERSE
           JSR    FORMAT
           BCS    BEGIN
           LDA    #$00
           JSR    NORMAL
           LDA    #$01
           JSR    INVERSE
           JSR    WDOS
           BCS    BEGIN
           LDA    #$01
           JSR    NORMAL
           LDA    #$02
           JSR    INVERSE
           JSR    WSPRIAL
           BCS    BEGIN
           LDA    #$02
           JSR    NORMAL

```

```

*****
*
* GET ALL DONE "RETURN"
*
*****

```

```

           LDA    #VTABCOM
           STA    VTAB
           LDA    #>NEMSG
           LDY    #<NEMSG
           JSR    PRINTASC
           JSR    GETASC
           JMP    BEGIN

```

```

*****
*
* INVERSE CURRENT COMMAND
*
*****
INVERSE     TAY
           LDA    INVHTAB,Y

```

```

           STA    HTAB
           LDA    #INVTAB
           JSR    GETBASE
           LDY    HTAB
           LDX    #$02
INVERSEA    LDA    (BASE),Y
           CMP    #$A0
           BEQ    INVERSEB
           AND    #$1F
           STA    (BASE),Y
INVERSEB    INY
           CPY    #$28
           BNE    INVERSEA
           RTS
INVERSEC    DEX
           BNE    INVERSEB
           RTS

```

```

*****
* TABLE FOR INVERSE/NORMAL
*
*****
INVTAB      HEX    000C19
*****
* ROUTINE TO NORMAL COMMAND
*
*****

```

```

NORMAL      TAY
           LDA    INVHTAB,Y
           STA    HTAB
           LDA    #INVTAB
           JSR    GETBASE
           LDY    HTAB
           LDX    #$02
NORMALA     LDA    (BASE),Y
           CMP    #$A0
           BEQ    NORMALC
           ORA    #$C0
           STA    (BASE),Y
NORMALB     INY
           CPY    #$28
           BNE    NORMALA
           RTS
NORMALC     DEX
           BNE    NORMALB
           RTS

```

```

*****
*
* GET READY TO FORMAT DISK
*
*****

```

```

FORMAT      JSR    GETDOS
           STA    BUFFER+1
           STY    BUFFER
           LDY    #$01
           LDA    (BUFFER),Y
           STA    SLOT
           INY

```



```

LDA (BUFFER),Y
STA DRIVE
LDY ##10
STA (BUFFER),Y
DEY
LDA SLOT
STA (BUFFER),Y
LDY ##0C
LDA ##04
STA (BUFFER),Y
INY
AND ##00
STA (BUFFER),Y
LDY ##03
STA (BUFFER),Y
*****
*
* GO TO RWTS AND FORMAT DISK *
*
*****
JSR GETDOS
JSR GODOS
BCS FORMATA
RTS
*****
*
* HANDLE ERROR IF RWTS FAILS *
*
*****
FORMATA LDA ##00
JSR NORMAL
LDA #VTABCOM
STA VTAB
LDA #>FERR
LDY #<FERR
JSR PRINTASC
JSR RINGBELL
JSR GETASC
SEC
RTS
*****
*
* PREPARE FOR WRITING D.O.S. *
*
*****
WDOS LDY ##02
WDOSB LDA OAM,Y
STA ROAM,Y
LDA CAM,Y
STA RCAM,Y
DEY
BPL WDOSB
CLC
LDA LENGTH+1
ADC ##01
STA RCOUNT
LDA START
STA RSTARTA
LDA START+1
STA RSTARTB
JSR GETDOS
STA BUFFER+1
STY BUFFER
LDY ##01
LDA (BUFFER),Y
STA SLOT
INY
LDA (BUFFER),Y
STA DRIVE
LDY ##10
STA (BUFFER),Y
DEY
LDA SLOT
STA (BUFFER),Y
LDY ##0C
LDA ##02
STA (BUFFER),Y
INY
AND ##00
STA (BUFFER),Y
LDY ##03
STA (BUFFER),Y
INY
STA (BUFFER),Y
INY
STA (BUFFER),Y
LDY ##0B
STA (BUFFER),Y
INY
LDA ##0F
STA (BUFFER),Y
*****
*
* GO TO DOS AND WRITE IT *
*
*****
JSR GETDOS
JSR GODOS
BCS WDOSA
RTS
*****
*
* HANDLE DOS WRITE ERROR'S *
*
*****
WDOSA LDA #VTABCOM
STA VTAB
LDA #>DERR
LDY #<DERR
JSR PRINTASC
JSR RINGBELL
JSR GETASC
SEC
RTS
*****
*
* ASCII DATA FOR GET DISK *
*
*****
MSG ASC " INSERT A BLANK"
ASC " DISK AND HIT"
ASC " RETURN"
HEX 00
*****
*
* ASCII DATA FOR "DISK DONE" *
*
*****
NMSG ASC "
ASC "DISKETTE "
ASC "PROTECTED"
HEX BD8D
ASC "
ASC "HIT RETURN"
ASC " TO CONTINUE"
HEX 00
*****
*
* ASCII DATA FOR FORMAT ERR *
*
*****
FERR ASC " FORMATTING "
ASC "ERROR- "
ASC "PROTECTION "
ASC "ABORTED"
HEX BD8D
ASC "
ASC "HIT RETURN"
ASC " TO CONTINUE"
HEX 00
*****
*
* ASCII DATA FOR WRITE ERROR *
*
*****
DERR ASC " WRITING "
ASC "ERROR - "
ASC "PROTECTION"
ASC " ABORTED"
HEX BD8D
ASC "
ASC "HIT RETURN"
ASC " TO CONTINUE"
HEX 00
*****
*
* ASCII DATA FOR SPIRAL ERR *
*
*****
SERR ASC " SPIRAL "
ASC "ERROR - "
ASC "PROTECTION"
ASC " ABORTED"
HEX BD8D
ASC "
ASC "HIT RETURN"
ASC " TO CONTINUE"
HEX 00

```

```

*****
#
# ASCII DATA FOR TITLE PAGE #
#
*****
TITLE      HEX    8D
          ASC "
          ASC "SPIRAL '
          ASC "PROTECTION '
          ASC "SYSTEM '
          HEX    8D8D
          ASC "
          ASC "  JOHN UHLE'
          HEX    8D8D
          ASC "~~~~~"
          ASC "~~~~~"
          ASC "~~~~~"
          ASC "~~~~~"
          HEX    8D8D
          HEX    DB
          ASC "RETURN)"
          ASC "PROTECT '
          ASC "DISKETTE'
          HEX    8D8D
          HEX    DB
          ASC "ESCAPE)"
          ASC "EXIT SPIRAL'
          ASC " SYSTEM'
          HEX    8D8D
          ASC "~~~~~"
          ASC "~~~~~"
          ASC "~~~~~"
          ASC "~~~~~"
          HEX    8D8D8D8D8D8D8D8D
          ASC "FORMATTING '
          ASC "WRITING DOS
          ASC "WRITING SPIRA
          HEX    00
*****
#
# GET A CHARACTER FROM KEYBD
#
*****
GETASC     BIT    KBCLR
GETASCA    LDA    KBGET
          CMP     #$7F
          BMI     GETASCA
          RTS
*****
#
# ENTER THIS ROUTINE WITH
# THE LINE# IN THE A-REG
#
*****
GETBASE    ASL
          TAY
          LDA     YTABLE,Y
          STA     BASE
          INY

```

```

          LDA     YTABLE,Y
          STA     BASE+1
          RTS
*****
#
# TABLE OF THE 24 BASE ADDRS #
#
*****
YTABLE     HEX    00048004
          HEX    00058005
          HEX    00068006
          HEX    00078007
          HEX    2804A804
          HEX    2805A805
          HEX    2806A806
          HEX    2807A807
          HEX    5004D004
          HEX    5005D005
          HEX    5006D006
          HEX    5007D007
*****
#
# PRINT UP TO A PAGE OF DATA #
#
*****
PRINTASC   STA     BUFFER+1
          STY     BUFFER
          LDA     #$00
          STA     BTAB
PRINTASCA  LDA     VTAB
          JSR     GETBASE
          JSR     CLEARLINE
          LDA     #$00
          STA     HTAB
PRINTASCB  LDY     BTAB
          LDA     (BUFFER),Y
          BEQ     PRINTASCF
          CMP     #$8D
          BEQ     PRINTASCD
          CMP     #$5E
          BEQ     PRINTASCH
          ORA     #$80
PRINTASCC  LDY     HTAB
          STA     (BASE),Y
          INC     HTAB
          LDA     HTAB
          CMP     #$2A
          BEQ     PRINTASCD
          JSR     PRINTASCE
          JMP     PRINTASCB
PRINTASCD  INC     VTAB
          JSR     PRINTASCE
          JMP     PRINTASCA
PRINTASCE  INC     BTAB
          BNE     PRINTASCF
          INC     BUFFER+1
PRINTASCF  RTS
PRINTASCH  LDA     #$20
          JMP     PRINTASCC

```

```

*****
#
# CLEAR CURRENT LINE OF TEXT #
#
*****
CLEARLINE  LDY     #$27
CLEARLINEA LDA     #$A0
          STA     (BASE),Y
          DEY
          BPL     CLEARLINEA
          RTS
*****
#
# CLEAR THE TEXT SCREEN
#
*****
HOME       LDA     #$17
          STA     VTAB
HOMEA      LDA     VTAB
          JSR     GETBASE
          JSR     CLEARLINE
          DEC     VTAB
          LDA     VTAB
          CMP     #$FF
          BNE     HOMEA
          LDA     #$00
          STA     VTAB
          RTS
*****
#
# RING THE ERROR BELL
#
*****
RINGBELL   LDA     #$10
RINGBELLA  LDY     #$20
RINGBELLB  LDX     #$50
RINGBELLC  DEX
          BNE     RINGBELLC
          BIT     SPRK
          DEY
          BNE     RINGBELLB
          SEC
          SBC     #$01
          BNE     RINGBELLA
          RTS
*****
#
# PREPARE FOR WRITING DATA
#
*****
WSPRIAL    JSR     COMPLEN
          BCS     ERROR
          JSR     NIBBALIZE
          LDA     #$00
          STA     CURTRK
          STA     NCOUNT
          LDA     #$02
          STA     DESTRK
          LDA     #$60

```



```

STA  SLOT
JSR  ACTIVATE
*****
* DRIVER TO CLEAR TRACK'S *
*****
CLEARLOOP JSR  POSITION
          JSR  CLEARTRACK
          INC  DESTRK
          DEC  COUNT
          LDA  COUNT
          BNE  CLEARLOOP
          JSR  COMPLEN
          LDA  #$02
          STA  DESTRK
*****
* DRIVER ROUTINE FOR WRITING *
*****
          LDA  #$00
          STA  BUFFER
          LDA  TEMPB
          STA  BUFFER+1
SPIRALOOP JSR  POSITION
          JSR  WRITRACK
          INC  DESTRK
          DEC  COUNT
          LDA  COUNT
          BNE  SPIRALOOP
*****
* FIX FOR RWTS AND END *
*****
          LDA  #$00
          STA  DESTRK
          JSR  POSITION
END        JSR  DEACTIVATE
          CLC
          RTS
*****
* IF AN ERROR OCCURS - FIX *
*****
ERROR      JSR  DEACTIVATE
          LDA  #$02
          JSR  NORMAL
          LDA  #VTABCOM
          STA  VTAB
          LDA  #>SERR
          LDY  #<SERR
          JSR  PRINTASC
          JSR  RINGBELL
          JSR  GETASC
          SEC
          RTS
*****
*****
* COMPUTE LENGTH ~ START *
*****
COMPLEN    LDA  LENGTH+1
          CMP  #$20
          BCC  COMPLENA
          RTS
COMPLENA    ADC  #$20
          ADC  #$01
          STA  BUFFERB+1
          STA  TEMPB
          LDA  LENGTH+1
          STA  COUNT
          INC  COUNT
          CLC
          RTS
*****
* CONVERT PROGRAM TO NIBBLES *
*****
NIBBALIZE  LDA  #$00
          STA  BUFFER
          STA  BUFFERB
          STA  NCOUNT
          LDA  #$20
          STA  BUFFER+1
          LDY  #$00
NIBBALIZEA LDA  (BUFFER),Y
          ROR
          ORA  #$AA
          STA  (BUFFERB),Y
          INY
          BNE  NIBBALIZEA
          INC  BUFFERB+1
NIBBALIZEB LDA  (BUFFER),Y
          ORA  #$AA
          STA  (BUFFERB),Y
          INY
          BNE  NIBBALIZEB
          INC  BUFFERB+1
          LDA  #$00
NIBBALIZEC EOR  (BUFFER),Y
          INY
          BNE  NIBBALIZEC
          LDY  NCOUNT
          PHA
          ROR
          INC  CURTRK
POSITIONNC LDA  CURTRK
          AND  #$03
          ASL
          ORA  SLOT
          TAX
          LDA  PHSON,X
          LDA  #$70
*****
JSR  MONWAIT
LDA  PHSOFF,X
JMP  POSITION
*****
* WRITE OUT A TRACK OF INFO *
*****
WRITRACK   LDX  SLOT
          LDY  #$FF
          LDA  WRITESW,X
          CMP  CLEARSW,X
          LDA  SYNC
          STA  SHIFTSW,X
          CMP  READSW,X
          NOP
          BIT  ZERO
*****
* WRITE OUT 32 BYTES OF SYNC *
*****
WRITRACKA  INC  ZERO
          DEC  ZERO
          LDA  SYNC
          NOP
          NOP
          NOP
          STA  WRITESW,X
          CMP  READSW,X
          DEY
          BNE  WRITRACKA
          NOP
          LDY  #$03
*****
* WRITE OPEN ADDRESS MARKS *
*****
WRITRACKB  LDA  OAM-1,Y
          BIT  ZERO
          DEC  ZERO
          BIT  ZERO
          STA  WRITESW,X
          CMP  READSW,X
          BIT  ZERO
          DEY
          BNE  WRITRACKB
*****
* WRITE NEXT 1/2 OF DATA *
*****
WRITRACKC  LDA  (BUFFER),Y
          NOP
          NOP
          PHA

```

```

PLA
STA WRITESW,X
CMP READSW,X
NOP
INY
BNE WRITRACKC
INC BUFFER+1

```

```

*****

```

```

*
* WRITE OTHER HALF OF TRACK
*

```

```

*****

```

```

WRITRACKD LDA (BUFFER),Y
PHA
PLA
STA WRITESW,X
CMP READSW,X
BIT ZERO
NOP
INY
BNE WRITRACKI

```

```

*****

```

```

*
* WRITE OUT THE CHECKSUM
*

```

```

*****

```

```

LDY NCOUNT
LDA CHECKSUM
PHA
PLA
STA WRITESW,X
CMP READSW,X
INY
LDA CHECKSUM
INC ZERO
DEC ZERO
PHA
PLA
STA WRITESW,X
CMP READSW,X
NOP
BIT ZERO
INY
STY NCOUNT
LDY #$02

```

```

*****

```

```

*
* WRITE OUT CLOSE ADDR MARKS *
*

```

```

*****

```

```

WRITRACKC LDA CAM-1,Y
PHA
PLA
STA WRITESW,X
CMP READSW,X
PHA
PLA
DEY
BNE WRITRACKC

```

```

LDY #$FF
*****
*
* WRITE OUT 32 BYTES SYNC
*
*****
WRITRACKF LDA SYNC

```

```

PHA
PLA
BIT ZERO
STA WRITESW,X
CMP READSW,X
NOP
NOP
NOP
NOP
DEY
BNE WRITRACKF
LDA CLEARSW,X
CMP READSW,X
INC BUFFER+1
RTS

```

```

*****
*
* CLEAR TRACK OUT OF SYNC
*
*****

```

```

CLEARTRACK LDX SLOT
LDA #$20
STA WCOUNT
LDY #$00
LDA WRITESW,X
CMP CLEARSW,X
LDA #$00
STA SHIFTSW,X
CMP READSW,X
NOP
BIT ZERO
INC ZERO
DEC ZERO
BIT ZERO
DEC ZERO
NOP
LDA #$00
STA WRITESW,X
CMP READSW,X

```

```

INY
BNE CLEARA
BIT ZERO
DEC WCOUNT
LDA WCOUNT
BNE CLEARB
LDA CLEARSW,X
CMP READSW,X
RTS
ORA #$AA
STA CHECKSUM,Y
INY

```

```

PLA
ORA #$AA
STA CHECKSUM,Y
INY
STY NCOUNT
LDY #$00
INC BUFFER+1
LDA BUFFER+1
CMP TEMPB
BNE NIBBALIZEA
LDA TEMPB
STA BUFFER+1
RTS

```

```

*****
*
* ACTIVATE THE DISK DRIVE
*
*****

```

```

ACTIVATE LDX SLOT
LDA DISKON,X
LDA #$EF
STA BUFFER
LDA #$D8
STA BUFFER+1
ACTIVATEA LDY #$12
ACTIVATEB DEY
BNE ACTIVATED
INC BUFFER
BNE ACTIVATEA
INC BUFFER+1
BNE ACTIVATEA
RTS

```

```

*****
*
* DEACTIVATE THE DISK DRIVE
*
*****

```

```

DEACTIVATE LDX SLOT
LDA DISKOFF,X
RTS

```

```

*****
*
* POSITION TO DESIRED TRACK
*
*****

```

```

POSITION LDA CURTRK
CMP DESTRK
BEQ POSITIONA
BCS POSITIONB
BCC POSITIONC
POSITIONA RTS
POSITIONB DEC CURTRK
JMP POSITIOND

```



# Listing 2

```

*****
*
* SPIRAL PROTECTION SYSTEM *
*
*   CREATED BY JOHN UHLEY   *
*
* THIS PROGRAM AND MANY OF *
* THE OTHER PROGRAMS IN THIS *
* SERIES IS AVAILABLE ON *
* DISKETTE. SEND $25.00 TO *
*
*   NIBBLE SOURCES         *
*   PO BOX 905             *
*   LARKSPUR, CA 94939     *
*
*****
*
* THIS PROGRAM MUST BE *
* LOADED INTO MEMORY ON PAGE *
* $OF BEFORE EXECUTING THE *
* SPIRAL PROTECTION WRITING *
* ROUTINE.               *
*
*****
                ORG    $0800
                LST     OFF
*****
*
* DEFINE THE VARIABLES USED *
*
*****
SLOT            EQU    $0000
CURTRK          EQU    $0001
DESTRK          EQU    $0002
COUNT          EQU    $0003
BUFFER          EQU    $0004
TEMP            EQU    $0006
GOBEGIN         EQU    $0010
*****
*
* DEFINE DISK II CTRL CARD *
*
*****
PHSOFF          EQU    $C080
PHSON           EQU    $C081
DISKOFF         EQU    $C088
DISKON          EQU    $C089
READSW          EQU    $C08C
MONWAIT         EQU    $FCAB
*****
*
* PREPARE FOR READING DATA *
*
*****
BEGIN           HEX    01
                HEX    A900
                STA     COUNT
                LDA     $002B

```

```

STA     SLOT
JSR     ACTIVATE
LDA     #$00
STA     CURTRK
LDA     #$04
STA     DESTRK
JSR     POSITION
LDA     #$00
STA     DESTRK
JSR     POSITION
FSTARTA    LDA     #$00
STA     BUFFER
LDA     #$02
STA     DESTRK
FSTARTB    LDA     #$20
STA     BUFFER+1
*****
*
* DRIVER ROUTINE FOR READING *
*
*****
MAINLOOP    JSR     POSITION
                JSR     READTRK
                INC     DESTRK
                INC     BUFFER+1
                DEC     COUNT
                LDA     COUNT
                BNE     MAINLOOP
                JSR     DEACTIVATE
                LDA     FSTARTA+1
                STA     GOBEGIN
                LDA     FSTARTB+1
                STA     GOBEGIN+1
                JMP     (GOBEGIN)
                RTS
*****
*
* ACTIVATE THE DISK DRIVE *
*
*****
ACTIVATE    LDX     SLOT
                LDA     DISKON,X
                LDA     #$EF
                STA     BUFFER
                LDA     #$D8
                STA     BUFFER+1
ACTIVATEA    LDY     #$12
ACTIVATEB    DEY
                BNE     ACTIVATEB
                INC     BUFFER
                BNE     ACTIVATEA
                INC     BUFFER+1
                BNE     ACTIVATEA
                RTS
*****
*
* DEACTIVATE THE DISK DRIVE *
*
*****

```

```

DEACTIVATE  LDX     SLOT
                LDA     DISKOFF,X
                RTS
*****
*
* POSITION TO DESIRED TRACK *
*
*****
POSITION    LDA     CURTRK
                CMP     DESTRK
                BEQ     POSITIONA
                BCS     POSITIONB
                BCC     POSITIONC
POSITIONA    RTS
POSITIONB    DEC     CURTRK
                JMP     POSITIOND
POSITIONC    INC     CURTRK
POSITIOND    LDA     CURTRK
                AND     #$03
                ASL
                ORA     SLOT
                TAX
                LDA     PHSON,X
                LDA     #$55
                JSR     MONWAIT
                LDA     PHSOFF,X
                JMP     POSITION
*****
*
* READ IN A TRACK FROM DISK *
*
*****
READTRK     LDX     SLOT
READTRKA    LDY     #$03
READTRKB    LDA     READSW,X
                BPL     READTRKB
                CMP     DAM-1,Y
                BNE     READTRKA
                DEY
                BNE     READTRKB
READTRKC    LDA     READSW,X
                BPL     READTRKC
                ROL
                STA     (BUFFER),Y
                INY
                BNE     READTRKC
READTRKD    LDA     READSW,X
                BPL     READTRKD
                AND     (BUFFER),Y
                STA     (BUFFER),Y
                INY
                BNE     READTRKD
READTRKE    LDA     READSW,X
                BPL     READTRKE
                ROL
                STA     TEMP
READTRKF    LDA     READSW,X
                BPL     READTRKF
                STA     TEMP+1

```

```

READTRKG  NOP
          LDA  READSW,X
          BPL  READTRKG
          CMP  CAM+1
          BNE  READTRK
READTRKH  LDA  READSW,X
          BPL  READTRKH
          CMP  CAM
          BNE  READTRK
          LDY  #$00
          LDA  TEMP+1
          AND  TEMP
          STA  TEMP
          TYA
READTRKI  EOR  (BUFFER),Y
          INY
          BNE  READTRKI
          CMP  TEMP
          BNE  READTRK
          RTS
DAM       HEX  96AAD5
CAM       HEX  AADEFF

```

#### Hex Dump for Listing 1

\*\$00.E90

```

0800- 20 55 0C A9 0A A0 BA 20
0808- 01 0C 20 B8 0B C9 BD F0
0810- 08 C9 9B D0 F5 20 55 0C
0818- 60 A9 0E B5 02 A9 09 A0
0820- 7F 20 01 0C 20 B8 0B C9
0828- 9B F0 D5 C9 BD D0 F5 20
0830- 4B 0C A9 00 20 70 08 20
0838- B9 0B B0 C4 A9 00 20 96
0840- 08 A9 01 20 70 08 20 04
0848- 09 B0 B5 A9 01 20 96 08
0850- A9 02 20 70 08 20 83 0C
0858- B0 A6 A9 02 20 96 08 A9
0860- 0E B5 02 A9 09 A0 A5 20
0868- 01 0C 20 B8 0B 4C 00 08
0870- A8 B9 93 08 B5 03 A9 13
0878- 20 C3 0B A4 03 A2 02 B1
0880- 05 C9 A0 F0 0A 29 1F 91
0888- 05 C8 C0 28 D0 F1 60 CA
0890- D0 F7 60 00 0C 19 A8 B9
0898- 93 08 B5 03 A9 13 20 C3
08A0- 0B A4 03 A2 02 B1 05 C9
08A8- A0 F0 0A 09 C0 91 05 C8
08B0- C0 28 D0 F1 60 CA D0 F7
08B8- 60 20 E3 03 85 08 B4 07
08C0- A0 01 B1 07 85 00 C8 B1
08C8- 07 85 01 A0 10 91 07 88
08D0- A5 00 91 07 A0 0C A9 04
08D8- 91 07 C8 29 00 91 07 A0

```

```

08E0- 03 91 07 20 E3 03 20 D9
08E8- 03 B0 01 60 A9 00 20 96
08F0- 08 A9 0E B5 02 A9 09 A0
08F8- E4 20 01 0C 20 6E 0C 20
0900- B8 0B 38 60 A0 02 B9 05
0908- 03 99 F3 0F B9 08 03 99
0910- F6 0F 88 10 F1 18 AD 03
0918- 03 69 01 BD 02 0F AD 00
0920- 03 BD 1F 0F AD 01 03 BD
0928- 27 0F 20 E3 03 85 08 B4
0930- 07 A0 01 B1 07 85 00 C8
0938- B1 07 85 01 A0 10 91 07
0940- 88 A5 00 91 07 A0 0C A9
0948- 02 91 07 C8 29 00 91 07
0950- A0 03 91 07 C8 91 07 C8
0958- 91 07 A0 08 91 07 C8 A9
0960- 0F 91 07 20 E3 03 20 D9
0968- 03 B0 01 60 A9 0E B5 02
0970- A9 0A A0 2D 20 01 0C 20
0978- 6E 0C 20 B8 0B 38 60 20
0980- 49 4E 53 45 52 54 20 41
0988- 20 42 4C 41 4E 4B 20 44
0990- 49 53 4B 20 41 4E 44 20
0998- 4B 49 54 20 22 52 45 54
09A0- 55 52 4E 22 00 20 20 20
09A8- 20 20 20 20 20 20 20 20
09B0- 44 49 53 4B 45 54 54 45
09B8- 20 50 52 4F 54 45 43 54
09C0- 45 44 BD BD 20 20 20 20
09C8- 20 20 20 20 20 48 49 54
09D0- 20 52 45 54 55 52 4E 20
09D8- 54 4F 20 43 4F 4E 54 49
09E0- 4E 55 45 00 20 46 4F 52
09E8- 4D 41 54 54 49 4E 47 20
09F0- 45 52 52 4F 52 2D 20 20
09F8- 20 50 52 4F 54 45 43 54
0A00- 49 4F 4E 20 41 42 4F 52
0A08- 54 45 44 BD BD 20 20 20
0A10- 20 20 20 20 20 20 4B 49
0A18- 54 20 52 45 54 55 52 4E
0A20- 20 54 4F 20 43 4F 4E 54
0A28- 49 4E 55 45 00 20 20 20
0A30- 57 52 49 54 49 4E 47 20
0A38- 45 52 52 4F 52 20 2D 20
0A40- 50 52 4F 54 45 43 54 49
0A48- 4F 4E 20 41 42 4F 52 54
0A50- 45 44 BD BD 20 20 20 20
0A58- 20 20 20 20 20 4B 49 54
0A60- 20 52 45 54 55 52 4E 20
0A68- 54 4F 20 43 4F 4E 54 49
0A70- 4E 55 45 00 20 20 20 53
0A78- 50 49 52 41 4C 20 45 52
0A80- 52 4F 52 20 2D 20 50 52
0A88- 4F 54 45 43 54 49 4F 4E
0A90- 20 41 42 4F 52 54 45 44
0A98- BD BD 20 20 20 20 20 20
0AA0- 20 20 20 4B 49 54 20 52
0AA8- 45 54 55 52 4E 20 54 4F
0AB0- 20 43 4F 4E 54 49 4E 55

```

```

0AB8- 45 00 BD 20 20 20 20 20
0AC0- 20 20 20 53 50 49 52 41
0AC8- 4C 20 50 52 4F 54 45 43
0AD0- 54 49 4F 4E 20 53 59 53
0AD8- 54 45 4D 20 BD BD 20 20
0AE0- 20 20 20 20 20 20 20 20
0AE8- 20 20 20 20 20 4A 4F 4B
0AF0- 4E 20 55 4B 4C 45 59 BD
0AF8- BD 5E 5E 5E 5E 5E 5E 5E
0B00- 5E 5E 5E 5E 5E 5E 5E 5E
0B08- 5E 5E 5E 5E 5E 5E 5E 5E
0B10- 5E 5E 5E 5E 5E 5E 5E 5E
0B18- 5E 5E 5E 5E 5E 5E 5E 5E
0B20- 5E BD BD DB 52 45 54 55
0B28- 52 4E 5D 20 20 20 50 52
0B30- 4F 54 45 43 54 20 44 49
0B38- 53 4B 45 54 54 45 BD BD
0B40- DB 45 53 43 41 50 45 5D
0B48- 20 20 20 45 5B 49 54 20
0B50- 53 50 49 52 41 4C 20 53
0B58- 59 53 54 45 4D BD BD 5E
0B60- 5E 5E 5E 5E 5E 5E 5E 5E
0B68- 5E 5E 5E 5E 5E 5E 5E 5E
0B70- 5E 5E 5E 5E 5E 5E 5E 5E
0B78- 5E 5E 5E 5E 5E 5E 5E 5E
0B80- 5E 5E 5E 5E 5E 5E 5E BD
0B88- BD BD BD BD BD BD BD 46
0B90- 4F 52 4D 41 54 54 49 4E
0B98- 47 20 20 57 52 49 54 49
0BA0- 4E 47 20 44 4F 53 20 20
0BAB- 57 52 49 54 49 4E 47 20
0BB0- 53 50 49 52 41 4C 20 00
0BB8- 2C 10 C0 AD 00 C0 C9 7F
0BC0- 30 F9 60 0A AB B9 D1 0B
0BC8- 85 05 C8 B9 D1 0B 85 06
0BD0- 60 00 04 80 04 00 05 80
0BD8- 05 00 06 80 06 00 07 80
0BE0- 07 28 04 AB 04 28 05 AB
0BE8- 05 28 06 AB 06 28 07 AB
0BF0- 07 50 04 D0 04 50 05 D0
0BF8- 05 50 06 D0 06 50 07 D0
0C00- 07 85 0B 84 07 A9 00 85
0C08- 04 A5 02 20 C3 0B 20 4B
0C10- 0C A9 00 85 03 A4 04 B1
0C18- 07 F0 2A C9 BD F0 1B C9
0C20- 5E F0 23 09 80 A4 03 91
0C28- 05 E6 03 A5 03 C9 2A F0
0C30- 06 20 3F 0C 4C 15 0C E6
0C38- 02 20 3F 0C 4C 09 0C E6
0C40- 04 D0 02 E6 0B 60 A9 20
0C48- 4C 25 0C A0 27 A9 A0 91
0C50- 05 88 10 F9 60 A9 17 85
0C58- 02 A5 02 20 C3 0B 20 4B
0C60- 0C C6 02 A5 02 C9 FF D0
0C68- F0 A9 00 85 02 60 A9 10
0C70- A0 20 A2 50 CA D0 FD 2C
0C78- 30 C0 8B D0 F5 3B E9 01
0C80- D0 EE 60 20 EE 0C B0 4B
0C88- 20 07 0D A9 00 85 10 85

```



# Hex Dumps and Key Perfect

A "Hex Dump" is a machine language program listing which simply shows which value is entered into each memory address for the range of the program. Despite popular opinion on the subject, "Hex" does not refer to the condition afflicting the user, but rather to the fact that the numbers are in Base 16 arithmetic, called hexadecimal.

The Apple Monitor allows you to enter those data bytes as number pairs, in order; the details are in your Reference Manual. Unfortunately, even one incorrect byte will cause undesired results. This can result in many unhappy hours of proofreading and checking.

Key Perfect was written by Ken McCandless to provide a way to verify typed-in program listings from magazines. Nibble Micro Sparc, an IAC Sponsoring Member, is the publisher. This is a first, experimental, use of Key Perfect in **Apple Orchard**, in the interest of helping those who type in listings, particularly hex dumps.

To do this, you need a copy of the Key Perfect Version 4.0 software that will allow you to make use of the checksum tables generated here. The product is available from the International Apple Core for \$29.95.

The tables on this page correspond to the Listings on the immediately preceding pages. Note that the "Total Program Check" item is the File Length parameter in Hex. After the listing is typed in and BSAVED to disk, RUN Key Perfect to check your diskfile. Key Perfect will generate a table which should be identical to the table on this page. If it is not, then one of us did something wrong. The nice thing about Key Perfect is that the table shows you approximately *where* an error is hiding, so if a mistake is made, finding it is much easier.

True, many people shy away from typing in listings. Key Perfect can help, and we're only too glad to co-operate with *Nibble* magazine to help reduce human frustration in the Apple World.

## KEY PERFECT 4.0 RUN ON LISTING 1

CODE	ADDR# - ADDR#
25D9	0800 - 084F
28FB	0850 - 089F
28D9	08A0 - 08EF
2269	08F0 - 093F
2416	0940 - 098F
2DA8	0990 - 09DF
2BBF	09E0 - 0A2F
2705	0A30 - 0A7F
2848	0A80 - 0ACF
1E60	0AD0 - 0B1F
288B	0B20 - 0B6F
24E7	0B70 - 0BBF
2885	0BC0 - 0C0F
259E	0C10 - 0C5F
2250	0C60 - 0CAF
2887	0CB0 - 0CFF
270C	0D00 - 0D4F
25E7	0D50 - 0D9F
273D	0DA0 - 0DEF
262D	0DF0 - 0E3F
2A39	0E40 - 0E8F
C0	0E90 - 0E90
TOTAL PROGRAM CHECK IS : 0691	

## KEY PERFECT 4.0 RUN ON LISTING 2

CODE	ADDR# - ADDR#
2580	0800 - 084F
25C8	0850 - 089F
2890	08A0 - 08EF
039A	08F0 - 08F8
TOTAL PROGRAM CHECK IS : F9	

```

0C90- 12 A9 02 85 11 A9 60 85
0C98- 00 20 55 0D 20 76 0D 20
0CA0- 55 0E E6 11 C6 0B A5 0B
0CAB- D0 F2 20 EE 0C A9 02 85
0CB0- 11 A9 00 85 07 A5 0E 85
0CB8- 08 20 76 0D 20 9E 0D E6
0CC0- 11 C6 0B A5 0B D0 F2 A9
0CC8- 00 85 11 20 76 0D 20 70
0CD0- 0D 18 60 20 70 0D A9 02
0CD8- 20 96 08 A9 0E 85 02 A9
0CE0- 0A A0 74 20 01 0C 20 6E
0CE8- 0C 20 88 0B 38 60 AD 03
0CF0- 03 C9 20 90 01 60 69 20
0CF8- 69 01 85 0A 85 0E AD 03
0D00- 03 85 0B E6 0B 18 60 A9
0D08- 00 85 07 85 09 85 12 A9
0D10- 20 85 08 A0 00 B1 07 6A
0D18- 09 AA 91 09 C8 D0 F6 E6
0D20- 0A B1 07 09 AA 91 09 C8
0D28- D0 F7 E6 0A A9 00 51 07
0D30- C8 D0 FB A4 12 48 6A 09
0D38- AA 99 10 03 C8 68 09 AA
0D40- 99 10 03 C8 84 12 A0 00
0D48- E6 08 A5 0B C5 0E D0 C5
0D50- A5 0E 85 0B 60 A6 00 BD
0D58- 89 C0 A9 EF 85 07 A9 D8
0D60- 85 08 A0 12 88 D0 FD E6
0D68- 07 D0 F7 E6 08 D0 F3 60
0D70- A6 00 BD 88 C0 60 A5 10
0D78- C5 11 F0 04 B0 03 90 06
0D80- 60 C6 10 4C 88 0D E6 10
0D88- A5 10 29 03 0A 05 00 AA
0D90- BD B1 C0 A9 70 20 AB FC
0D98- BD 80 C0 4C 76 0D A6 00
0DA0- A0 FF BD 8D C0 DD 8E C0
0DAB- AD 04 03 9D 8F C0 DD 8C
0DB0- C0 EA 24 0F E6 0F C6 0F
0DB8- AD 04 03 EA EA EA 9D
0DC0- 8D C0 DD 8C C0 88 D0 EC
0DC8- EA A0 03 B9 04 03 24 0F
0DD0- C6 0F 24 0F 9D 8D C0 DD
0DD8- 8C C0 24 0F 88 D0 EC B1
0DE0- 07 EA EA 48 68 9D 8D C0
0DE8- DD 8C C0 EA C8 D0 F0 E6
0DF0- 08 B1 07 48 68 9D 8D C0
0DF8- DD 8C C0 24 0F EA C8 D0
0E00- F0 A4 12 B9 10 03 48 68
0E08- 9D 8D C0 DD 8C C0 C8 B9
0E10- 10 03 E6 0F C6 0F 48 68
0E18- 9D 8D C0 DD 8C C0 EA 24
0E20- 0F C8 84 12 A0 02 B9 07
0E28- 03 48 68 9D 8D C0 DD 8C
0E30- C0 48 68 88 D0 F0 A0 FF
0E38- AD 04 03 48 68 24 0F 9D
0E40- 8D C0 DD 8C C0 EA EA EA
0E48- EA 88 D0 EC BD 8E C0 DD
0E50- 8C C0 E6 08 60 A6 00 A9
0E58- 20 85 0F A0 00 BD BD C0
0E60- DD 8E C0 A9 00 9D 8F C0

```

```

0E68- DD BC C0 EA 24 0F E6 0F
0E70- C6 0F 24 0F C6 0F EA A9
0E78- 00 9D 8D C0 DD 8C C0 C8
0E80- D0 EC 24 0F C6 0F A5 0F
0E88- D0 E8 BD 8E C0 DD 8C C0
0E90- 60

```

### Hex dump for Listing 2

#F00.FF8

```

0F00- 01 A9 00 85 03 A5 2B 85
0F08- 00 20 4B 08 A9 00 85 01
0F10- A9 04 85 02 20 6C 08 A9
0F18- 00 85 02 20 6C 08 A9 00
0F20- 85 04 A9 02 85 02 A9 20
0F28- 85 05 20 6C 08 20 9A 08
0F30- E6 02 E6 05 C6 03 A5 03
0F38- D0 F0 20 66 08 AD 1F 08
0F40- 85 10 AD 27 08 85 11 6C
0F48- 10 00 60 A6 00 BD 89 C0
0F50- A9 EF 85 04 A9 D8 85 05
0F58- A0 12 88 D0 FD E6 04 D0
0F60- F7 E6 05 D0 F3 60 A6 00
0F68- BD 88 C0 60 A5 01 C5 02
0F70- F0 04 B0 03 90 06 60 C6
0F78- 01 4C 7E 08 E6 01 A5 01
0F80- 29 03 0A 05 00 AA BD 81
0F88- C0 A9 55 20 AB FC BD 80
0F90- C0 4C 6C 08 A6 00 A0 03
0F98- BD 8C C0 10 FB D9 F2 08
0FA0- D0 F4 88 D0 F3 BD 8C C0
0FAB- 10 FB 2A 91 04 C8 D0 F5
0FB0- BD 8C C0 10 FB 31 04 91
0FB8- 04 C8 D0 F4 BD 8C C0 10
0FC0- FB 2A 85 06 BD 8C C0 10
0FC8- FB 85 07 EA BD 8C C0 10
0FD0- FB CD F7 08 D0 BE BD 8C
0FD8- C0 10 FB CD F6 08 D0 B4
0FE0- A0 00 A5 07 25 06 85 06
0FE8- 98 51 04 C8 D0 FB C5 06
0FF0- D0 A2 60 96 AA D5 AA DE
0FF8- FF

```

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030	070	110	150	190	230	270
031	071	111	151	191	231	271
032	072	112	152	192	232	272
033	073	113	153	193	233	273
034	074	114	154	194	234	274
035	075	115	155	195	235	275
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☐ Education  
☐ Other
- I use my computer primarily with**  
☐ Word Processor  
☐ Business Software  
☐ Modem  
☐ Graphics  
☐ Electronic Spreadsheet  
☐ Data Base  
☐ Games  
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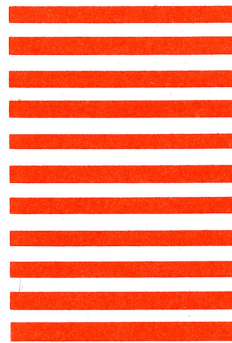


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# PDQ II MAKES YOUR APPLE MICRO PERFORM LIKE A MINICOMPUTER

## PRODUCTIVITY INCREASE

PDQ II will make your Apple II or IIe outperform itself. It will fly through tasks which used to take hours. It will perform multiple tasks at the same time. Most Apple software programs will exhibit a 200 to 2,000 percent increase in speed, without reprogramming.

## NEXT GENERATION CAPABILITIES

That's not all—when you plug a PDQ II into your Apple, it will provide the advanced features of the 16/32 bit MC68000 microprocessor. Your Apple will be capable of utilizing sophisticated, "next generation" software products.

## ONE SIMPLE SOLUTION

PDQ II eliminates the need for numerous add-ons — it includes an integrated high speed pseudo-disk, printer/communications buffer, memory extension capability and a powerful 16/32 bit processor. PDQ II consists of two system boards which simply plug inside your Apple, making your Micro think it's a Mini.

## PDQ II SYSTEM SPECIFICATIONS

### Standard Features

#### Microprocessor

- 16/32 bit MC68000
- 10 MHz

#### User Memory

- 256K Bytes RAM

#### Integrated Functionality

- Multiple printer/communications buffering
- Pseudo-disk operations
- Track buffering (p-System)

#### ETC Software

- ETC MC68000 Assembler
- ETC MC68000 System Monitor
- ETC p-System (version IV) to Apple DOS Interface Utility

#### Languages and Software Systems Supported

- Applesoft BASIC Compatibility & Speed up
- Apple DOS 3.3
- UCSD p-System (version IV) Interpreter—executes UCSD Pascal, FORTRAN-77 and BASIC P-Code

### Optional Features

#### Hardware

- 1 Megabyte RAM (Fall 1983)

#### Software

- UCSD p-System Development System
- UCSD Pascal
- FORTRAN
- BASIC
- Unix-like Operating System
- Artificial Intelligence Laboratory incorporating a Deductive Reasoning System (Spring 1984)

## INSURANCE FOR THE FUTURE

PDQ II provides a powerful p-System run time environment, making it possible for your Apple to take advantage of many of the hundreds of high-quality p-System applications...the same applications available for Digital, IBM, HP, and other computers.

PDQ II technology makes your current investment in software and training more productive, while providing an almost unlimited growth path.

Now wouldn't you like to have the PDQ II performing for you?

PDQ II comes with a full one year warranty and will be available through your local Apple dealer beginning in July. If you simply cannot wait, send your check or M.O. for \$1495 (postage included) to: Enhancement Technology Corporation, P.O. Box 1267, Pittsfield, MA 01202. Mass residents must include 5% sales tax.

We'll send you the PDQ II. P.D.Q.!

**PDQ II**  
*The Ultimate Peripheral*



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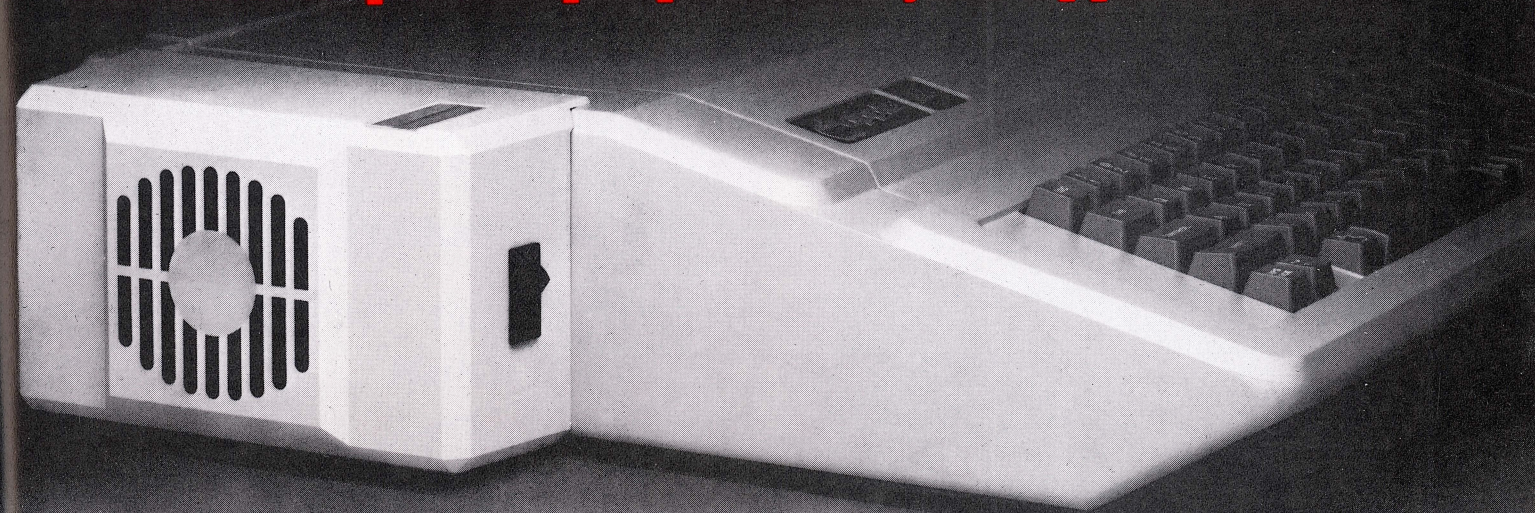
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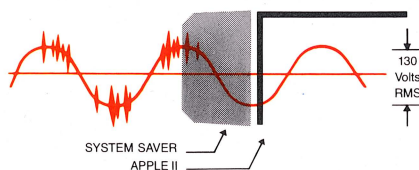
# System Saver™

**The most important peripheral for your Apple II and IIe.**



## For Line Surge Suppression

The SYSTEM SAVER provides essential protection to hardware and data from dangerous power surges and spikes.

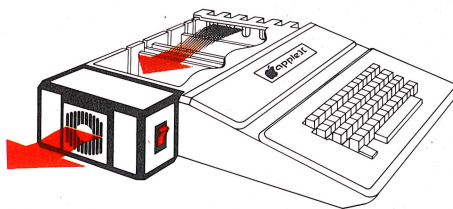


By connecting the Apple II power input through the SYSTEM SAVER, power is controlled in two ways: 1) Dangerous voltage spikes are clipped off at a safe 130 Volts RMS/175 Volts dc level. 2) High frequency noise is smoothed out before reaching the Apple II. A PI type filter attenuates common mode noise signals by a minimum of 30 dB from 600 khz to 20 mhz, with a maximum attenuation of 50 dB.

## For Cooling

As soon as you add 80 columns or more memory to your Apple II you need SYSTEM SAVER.

Today's advanced peripheral cards generate more heat. In addition, the cards block any natural air flow through the Apple II creating high temperature conditions that substantially reduce the life of the cards and the computer itself.

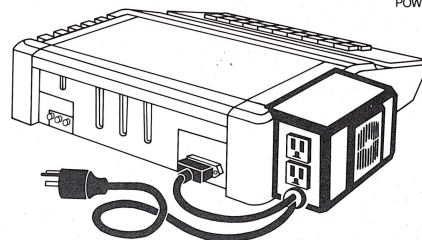
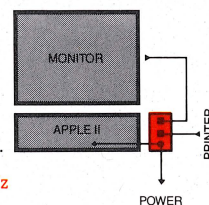


SYSTEM SAVER provides correct cooling. An efficient, quiet fan draws fresh air across the mother board, over the power supply and out the side ventilation slots.

## For Operating Efficiency

SYSTEM SAVER contains two switched power outlets. As shown in the diagram, the SYSTEM SAVER efficiently organizes your system so that one convenient, front mounted power switch controls SYSTEM SAVER, Apple II, monitor and printer.

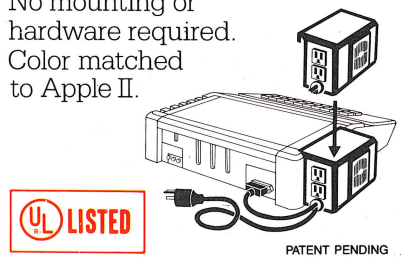
Available in 220/240 Volt. 50 Hz



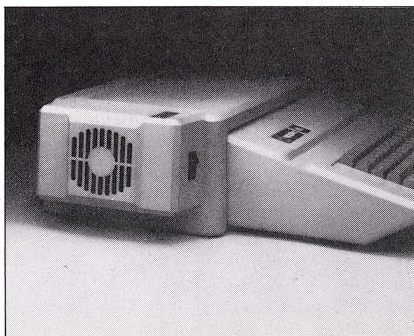
The heavy duty switch has a pilot light to alert when system is on. You'll never use the Apple power switch again!

## Easy Installation

Just clips on.  
No mounting or  
hardware required.  
Color matched  
to Apple II.



## Compatible with Apple Stand



**\$89.95 at your local dealer or order direct by phone or mail.**

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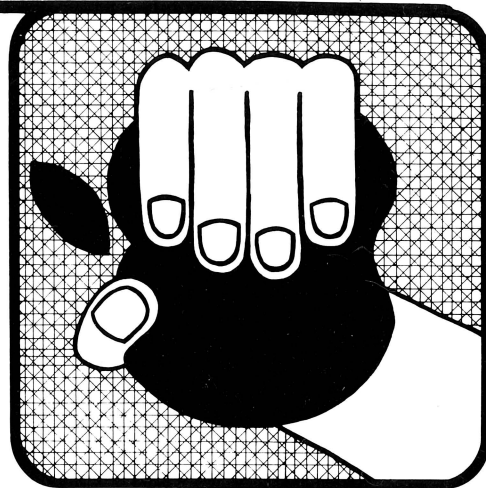




# The New Stuff

## New Products For The Apple

*Edited by*  
**Mark L. Crosby**



Producers of products for Apple Computers should send news releases two months in advance:

### NEW PRODUCTS EDITOR

**Apple Orchard**  
908 George St.  
Santa Clara, CA 95050

The IAC cannot be held responsible for claims made by manufacturers.

*The most comprehensive listing and description of new temptations, delicacies, and necessities for your Apple. Notice too that we've made it even easier for you to find out more about these items: just circle the corresponding number on the Apple Orchard Direct Help Card a bit farther ahead in this issue. We'll forward the requests directly to the manufacturer.*

## HARDWARE

### Input/Output

#### Contents:

#### HARDWARE

Input Output  
Memory  
Printers/Plotters  
Miscellaneous

#### SOFTWARE

Business (General)  
Communications  
Educational  
Financial  
Games/Simulations  
Graphics  
Languages (Programming)  
Music  
Utilities  
Word Processing

#### BOOKS/CATALOGS

#### MISCELLANEOUS

The **PRO 100 detachable keyboard** is a 100 key keyboard that features 3 modes with no chip changes, and 5 foot cables. Offers 18 software supported function keys; 25 Apple BASIC keys and 22 VisiCalc keys to put user commands into one key function. Offers horizontal and vertical cursor movement, separate number pad with enter key, relocated reset key (soft set) and a full 128 ASCII coded keyboard. Has automatic repeat, typewriter style configuration, 35 cps typing input and high reliability keyswitches - \$265.00. Optional upper/lower case chip (Rev. 7 and later) and a Pre-boot diskette contains utilities, keyboard information and a useful word processor and graphics program that demonstrates the programming flexibility of the function keys - \$35.00.

*Circle Help No.67*

Amkey, Inc.  
2200 Ballardvale Street  
Wilmington, MA 01887  
(617) 658-7800

**Infax 101A disk drive** features a removable 10 megabyte data cartridge. Your Apple can have almost infinite storage capacity

with this new drive. Features microprocessor-based error correction; user transparent error detection and correction; automatic start-up diagnostics, idle drive shut-down, error recovery procedures; host adapter/controller and software supports up to 4 drives simultaneously; cartridge write protect switch; non-contact head to disk interface. Comes with disk drive, data cartridge, power supply, cables and personal computer adapter. Software included supports Apple DOS 3.3, Pascal and CP/M, provides for quick copying, backup and file management - \$1,795.00.

*Circle Help No.68*

Vufax, Inc.  
5301 Covington Highway  
Decatur, GA 30035  
(800) 241-1119; (404) 981-6778 (GA)

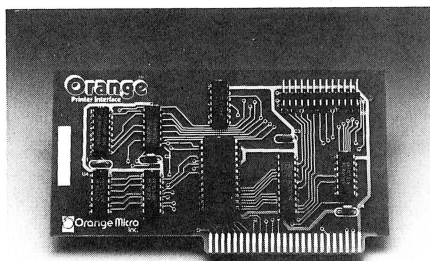
A new **Laboratory Thermometer System** for the Apple II Plus takes up to seven precision temperature sensors. With a real-time clock calendar, it can control data recording on disk or printer. Sensors can be extended up to 1,000 feet for remote sensing and 8 output lines are provided for controlling external devices. The temperature range is from -50 to +150 Celsius (-58 to 302 F). Readings may be converted and presented in degrees Fahrenheit, Centigrade or Kelvin as desired. No computer expertise is necessary. Air or piping types of probes are available. - \$260.00 with 2 air probes, interface card, software on disk, and an instruction manual. Includes a 90 day limited warranty. Requires an Apple II with 48K and disk.

*Circle Help No.75*

Assembly Associates  
P. O. Box 551



Epping, NH 03042  
(603) 679-8410



**Dual Function Interface Card** allows a printer and modem, or any other combination of parallel/serial peripherals to be connected to and controlled by the Apple II. It is compatible with BASIC, Pascal, and CP/M operating systems and features software selectable configuration options \$229.00. At your local dealer.

*Circle Help No.69*

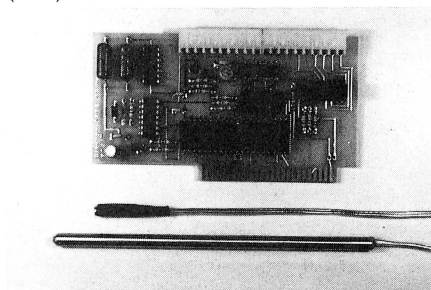
Videx Inc.  
897 N.W. Grant Avenue  
Corvallis, OR 97330  
(503) 758-0521

The **Orange Interface for Apples** and printers has more than 15 firmware commands for text screen dumping and formatting on any Apple II computer. It is compatible with most parallel printers. Includes an 80 column screen dump for the Apple II/e. Other commands include a 40 column screen

dump, page length and margin sets, add or delete line feeds, and much more. When not in use for formatting, the Orange Interface acts as a standard parallel interface, compatible with virtually all Apple software, CP/M and Pascal. \$87.00 includes complete documentation, a 5 foot parallel printer cable and a full 90 day warranty.

*Circle Help No.76*

Orange Micro  
1400 N. Lakeview  
Anaheim, CA 92807  
(714) 779-2772



**Diskulator 64K-512K** will work with the Apple II/e. Includes DOS 3.3, Pascal, CP/M, Macrodisk-Multi which allows you to set up to 3 RAM-disks in presetable sizes from 16K to 512K, Macrospeed high speed disk copy program particularly useful for multiple copies - load the whole disk to the card and copy from there. Upload/download backup/retrieval programs can be used for disk copying under program control and for memory diagnostics. MagiCalc, the new spreadsheet, will automatically utilize Macrotech memory boards, including the Diskulator. Features variable column widths, flexible move commands, the largest spreadsheet capability and many other advanced features.

*Circle Help No.70*

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Long Beach, CA 90808

-or-

1370 Marine Drive  
North Vancouver, B.C.  
Canada V7P 1T4  
(604) 984-9305

The APIC parallel printer interface card includes card, cable, and Graph-it graphics software. Works with any standard parallel printer. Graph-it, a complete graphics dump program allows you to do a screen dump to any of the following printers: Apple Dot Matrix, MPI, IDS, NEC, Okidata, Silentype, Epson, Trendcom, Anadex, C. Itoh, and Centronics. Simply choose your printer from a menu and print. You can print graphs, charts, equations, grids, logos, titles, and Hi-Res Apple graphics. You can also magnify, print normal or reverse image, do page centering and cropping, or insert graphics, superscripts, and subscripts into any Applewriter II file - \$129.00

*Circle Help No.72*

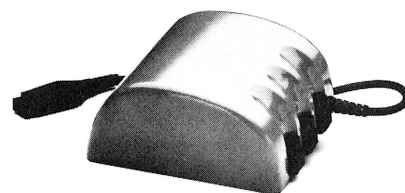
SSM Microcomputer Products, Inc.  
2190 Paragon Drive

San Jose, CA 95131  
(408) 946-7400

**Command Control Mouse** is optically-encoded and enables users of personal and small business computers to edit, draw lines or select menu choices without ever touching the keyboard. Model 50-2110 for the Apple II is used by simply sliding the hand-held device across a desktop surface. The user can quickly move the cursor to any point on the CRT screen - add, delete or move words and shapes with the touch of a button. It functions as a word processing editor, spreadsheet analyst, and an alternate input device. Three multiple function buttons can be used for any number of program applications. Comes with a five-foot long tail-like cord that connects to the computer via an interface card. With the interface card, Command Control Mouse will perform multiple functions written into software programs with mouse control options.

*Circle Help No.77*

WICO Corporation  
6400 Gross Point Road  
Niles, IL 60648



The **Touch Tone Decoding Modem** connects the direct dial telephone network with a host computer and may be used in conjunction with any host computer capable of asynchronous communications via an RS-232 port. Autoanswer circuitry is incorporated into this unit. It goes off-hook and awaits suitable Touch Tone input for two minutes. If no input is received, the modem resets automatically to on-hook and awaits the next call. Converts touch tones to the ASCII equivalent and sends it in a serial stream to the host. Outgoing data is transmitted normally by the modem at 300 or 1200 bps. An audio port for voice response is also available. Communications with the host RS-232 is at 300, 600, or 1200 baud, via a standard D-25 connector. In voice response applications, the digital input of the modem can be replaced with an audio input circuit - \$500.00

*Circle Help No.71*

Microperipheral Corporation  
2565 152nd Avenue N.E.  
Redmond, WA 98052  
(206) 881-7544

**Arcade-Dapter** with Auto-Repeat permits you to use the new arcade-quality Atari compatible joysticks with your Apple II computer. No software drivers required. Works with All Apple II games which use standard or user-definable keyboard for-



SCORE HIGHER ON THE SAT USING THIS 5 1/4 INCH DISKETTE ON THE APPLE COMPUTER. DRILLS ON MATH I

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(513) 761-0380

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mats. Features lightning fast response; incredible action; auto-repeat function, using either the joystick or keyboard. Requires a Rev. 4 or newer Apple II or II Plus computer - \$41.95.

Circle Help No.73  
Computechiques  
P.O. Box 245  
Fairfield, OH 45014  
(513) 829-5052

**The Operator** is a single card modem with all of its sophisticated features tucked into one circuit board. No costly add-ons or external boxes to complicate things. Just plug it directly into the slot of your Apple II (any type) or Apple compatible computer and you're ready to communicate. Comes complete with easy documentation plus start-up software programs on disks. Compatible with ASCII Express Pro, Data Capture, Modem Magic II, TermExec, Transcend I, II, and III, VisiTerm, Z-Term, and many more. Features 110/300 baud full or half duplex; auto answer with disconnect, rotary or Touch-Tone, key-set compatible \$159.95.

Circle Help No.74  
TIMECOR  
P.O. Box 8928  
Boston, MA 02114  
(617) 720-4090  
(617) 720-3600 (Modem); (800) 824-7888 operator 52

The **B & D RS-232 Serial card** does it all. Communicate with a modem, remote terminal or Teletype. Flip a switch and have letter quality serial printer protocol. \$44.95 as a kit or \$59.95 assembled. Included is an RS-232 type connector and a comprehensive instruction manual. Also includes an extended 6 month warranty and a terminal emulation program.

Circle Help No.79  
B & D Electronics  
P. O. Box 3651  
Lawrence, KS 66044  
(913) 841-4182

**The Networker** is a plug-in single-slot direct connect modem for your Apple II (any type) or other Apple compatible computer. It even comes complete with its own communications software that features "data capture" to lock the messages into your Apple's RAM, and then save the information onto a disk for easy reference and review. A terminal program displays on-screen help menus, continuous updates of memory usage, carrier presence, baud rate, communications status, all while taking in and displaying information from any computer. Supports both originate and answer modes in half or full duplex - \$129.00. For \$179.00 you also get Netmaster for advanced users which permits high speed transfer from Apple to Apple without error, uses its own disk operating system, and is completely configurable to under-

stand any computer, even mainframes. File size is unlimited. Netmaster may be purchased separately for \$79.00.

Circle Help No.80  
Zoom Telephonics, Inc.  
207 South Street  
Boston, MA 02111  
(800) 631-3116; (617) 423-1288 (MA)  
The **Floppycard III** introduces 8-inch floppy disk storage to the Apple /// computer. In addition to standard single- or double-sided 8-inch drives, Floppycard III also supports all disk drives that emulate the popular 8-inch disk interface, including the Amlyn 5.25-inch 5.5 Megabyte cartridge drive and the C. Itoh 5.25" 1.1 Megabyte floppy drive. Operates in any SOS-compatible environment, including Apple Business BASIC, Pascal, and SoftCard III CP/M. It has its own microprocessor to allow the Apple III to process interrupts (keyboard input, communications, printer output, etc.) while the diskette is being read or written. Features up to 4.4 Megabytes of storage on standard 8" floppy drives.

Circle Help No.81  
Burtronix  
1667 N. O'Donnel Way  
Orange, CA 92667  
(714) 974-6171  
The **Burtronix Printer card ///** allows Centronics type parallel printers to be used with the Apple ///, and features software drivers to print both text and graphics. The graphics

## AMPERSOFT

### Utility Routines Library for the Apple II/Ie

There you are, sitting in front of a dead screen, wondering if your Apple has broken down or if your program has gone to sleep.

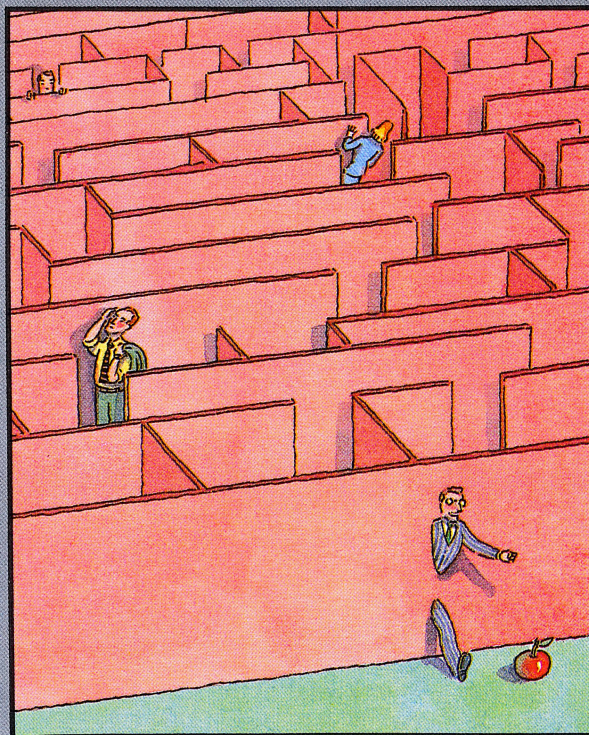
If you're running into slow executions and long and frequent pauses, AMPERSOFT will give you a lot more time to be creative. It's an entire library of Applesoft enhancements that run at machine language speeds.

If most programs take away memory, this one gives it back. AMPERSOFT is the only Applesoft enhancement package that puts DOS and itself in the upper 16K of a 64K system, giving you a new usable gain of thirty percent instead of a net memory loss.

And AMPERSOFT is a pleasure to use. All the utilities are accessed from within your Applesoft programs by inserting simple, one-line statements preceded by an ampersand.

They let you Sort sixty times faster than Applesoft. Collect garbage two to three hundred times faster. And format reports to the screen or printer any way you want them.

If you're tired of waiting for your Apple, you don't have to wait any more. AMPERSOFT is here.



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**SPEED ADVANTAGES:**  
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**OTHER FEATURES:**  
30% more user program memory.  
Matrix arithmetic.  
Selective array clear.  
Full PRINT USING formatting for numbers and character strings.  
Two-key disk commands.  
Compatible with GALE, PLE, FID, MUFFIN, COPYA and all DOS Toolkit programs.  
Allows concurrent residence of Applesoft and Integer BASIC with 32K RAM card, extra 16K card, or ROM card in another slot.

**AUTHOR:**  
Cornelis Bongers

**SYSTEM REQUIREMENTS:**  
At least 64K, Applesoft, DOS 3.3 and one Disk Drive. Operates with all Applesoft-Compatible computers including the Apple IIe and the Franklin ACE. Apple II Plus requires RAM card — 16K or larger.

**PRICE:**  
\$49.95 postpaid

**ORDERING INFORMATION:**  
If your Apple dealer doesn't have AMPERSOFT you may order directly by mail or phone. (Mass. residents please add 5% sales tax.) We also accept VISA and MasterCard.

**MicroSPARC Inc.**

10 Lewis Street, Lincoln, MA 01773 (617) 259-9710

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routines print any of the Apple /// graphics modes using dot matrix printers, including color printouts when using the IDS PRISM printer. Simple commands permit the graphics printouts to be rotated left or right, expanded horizontally, expanded vertically, cropped, inversed (black/white exchanged), left margined, and top margined. The graphics printouts may come from buffer 1, buffer 2, both buffers side by side, or in the new 560 x 384 resolution mode with both buffers interleaved. Features include auto line feed, auto form feed, top of form, and printer initialization. Compatible with Apple Business BASIC, Pascal, and Soft-Card /// CP/M - \$159.00.

*Circle Help No.82*

Burtronix

1667 N. O'Donnel Way

Orange, CA 92667

(714) 974-6171

**ComDrive**, a new double floppy disk drive replaces two standard Apple floppy drives of 143 Kbytes capacity, yet occupies half the space. The CR-1000 is plug-compatible with Apple computers and provides a total of 286 Kbytes formatted capacity in a single, low-profile package. The ComDrive fits snugly on top of an Apple computer. A monitor can be mounted, in turn, on top of the disk drive. Features a seek time of 40 milliseconds and a track density of 48 tracks per inch in a single-sided, single-density format. Dimensions of the slim, compact drive are 14.9 inches wide, 10.1 inches deep, and only 2.1 inches high. It weighs about 10 pounds. \$599 suggested retail price.

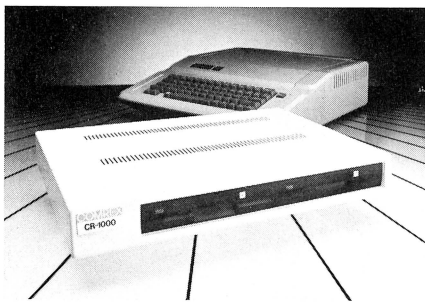
*Circle Help No.83*

Comex International, Inc.

3701 Skypark Drive

Torrance, CA 90505

(213) 373-0280



Touch the **Magellan Light Pen** to your Apple II or ///e and your graphic and game designs come to life. High-speed, high-resolution graphics with the control of one dot accuracy. Connects to a micro-miniature electronic module you plug into your computer game port. Its input/output transparent design lets you use the same port for game paddles, joysticks and other accessories simultaneously. Think of it as a normal pen and paper - except the paper is replaced by your monitor. Simply point the pen on the screen and press the programmable switch on the pen's body. In seconds,

you can draw points, lines, circles, squares and other standard shapes. Once a drawing is complete, it can be saved and/or printed to be used or edited later. Driver software is included along with Graphics Drawing software and complete documentation. Provides vertical blanking signal for flicker-free graphics - \$189.95.

*Circle Help No.78*

Magellan Computer, Inc.

4371 East 82nd Street, Suite D

Indianapolis, IN 46250

(317) 842-9138

The Model 3120T professional **Analog-To-Digital Recorder** with graphics contains an internal solid state memory for storage of 16,000 data points. Features two-channels with a maximum sensitivity of 0.1 mv/cm with an accuracy of 0.1%. The time scale is accurate to 0.01%. Digitizing speed is 20 KHz with 12-bit precision. A bidirectional RS-232C interface is offered as an option and a software package converts the recorder to a graphics plotter with a vector generator, a high level instruction set, and a 53 character ASCII set. Software for interfacing to Apple II is also available - \$2,995.

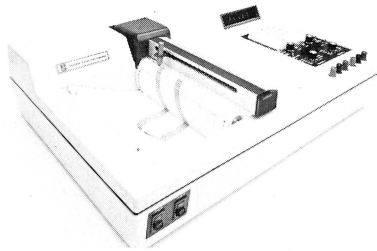
*Circle Help No.84*

Bascom-Turner Instruments

111 Chapel Street

Newton, MA 02158

(617) 964-3434



**Project 1** presents a low cost Centronics type interface card. This unbuffered parallel interface card is designed to work with Epson, Star Micronics, Axiom, Codex or almost any 8-bit parallel printer available. In addition, for only \$9.95, they supply you with a graphics capability for your Epson printer. Some of the graphics features available are: normal and inverse image, large or small image, load program direct from the disk, dump existing programs already in the computer. Works under Apple DOS 3.3. Complete with an FT interconnect cable with Centronics type plug, factory wired for the Epson MX printer family - \$59.95 plus \$9.95 for the graphics option.

*Circle Help No.85*

Project 1

220 Crescent Way, Bldg O

Anaheim, CA 92801

(714) 774-0394

**P/S Buffer Card** lets your Apple II and ///e print parallel or serial. Memory is expandable to 64K maximum in increments of 16K with plug-in RAM modules available from your dealer. It has both a parallel

output port and an RS-232C standard serial output port. When you need to change from parallel to serial, serial to parallel, or output both simultaneously, you don't have to physically change cards. The intelligent firmware lets you do it by either software command or (optional) hardware switch. Interfaces with most popular parallel printer cards including Apple, Epson, Grappler, Graphitti, PRT-1 and Tymac. 16K card for use with existing parallel interface card \$125.00. Stand-alone card with parallel interface \$199.00. With Graphitti Graphics and cables \$249.00. 16K memory expansion modules \$25.00 each. Hardware switch option \$25.00.

*Circle Help No.86*

Prometheus Products Inc.

45277 Fremont Blvd.

Fremont, CA 94538

(415) 490-2370

**Joysticks** from Hayes products use only precision high quality components. Compare for yourself and save up to 40%. These highly accurate and reliable joysticks provide a 360 degree cursor control for total coordinated x/y control. Fine trim adjustment on both axes and a self-centering feature which can be disengaged to allow for a free-floating stick are standard features on all Hayes joysticks. The Mach II is \$39.95, The Mach III (with handle push button switch for rapid fire) is \$49.95 plus \$2.00 postage and handling.

*Circle Help No.87*

Hayes Products

1558 Osage Street

San Marcos, CA 92069

(619) 744-8546

## Memory

The **S'Card** from Legend Industries, Ltd. is the first RAM card to upgrade an Apple II or Apple /// from 64K to a full **1 Megabyte**. Can be installed into any slot and up to 7 cards can be installed into one Apple II for 7 Megabytes. All of the software written for the 64KC and 128KDE cards will work with the S'Card including all of the software from other software houses. New software being developed by Legend will take advantage of the added RAM capacity of the S'Card.

*Circle Help No.88*

Legend Industries, Ltd.

2220 Scott Lake Road

Pontiac, MI 48054

(313) 674-0953

## Printers/Plotters

The **Gorilla/Banana** is an 80 column, tractor-feed dot-matrix printer, capable of printing alphanumerics or graphics on fan-fold forms from 4½ to 10 inches wide. Print speed is 50 characters per second. The

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### CONTINENTAL SOFTWARE

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Maze Craze ..... \$28.00

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VisiSchedule ..... 210.00  
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VisiTrend/Plot ..... 225.00

### HARDWARE

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Kraft Paddles ..... 35.00  
Sirius Joyport ..... 36.00  
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Grappler + ..... \$125.00  
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(SS/SD) ..... \$22.00  
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Rana Elite 1 ..... \$289.00  
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**VISA**



print head is a uni-hammer design for greater simplicity and consistency. Characters are printed in a clear 5x7 matrix similar to that used by many CRT terminals. Normal character spacing is the standard 10 characters per inch (cpi) or double wide 5 cpi can be substituted under software control. Graphics mode has a density of 63 x 60 dots per inch. Includes a Centronics type parallel interface. \$249.95.

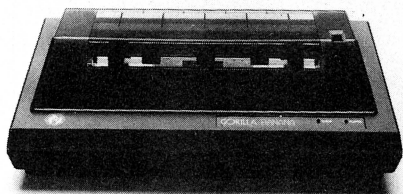
Circle Help No. 114

Leading Edge Products, Inc.

225 Turnpike Street

Canton, MA 02021

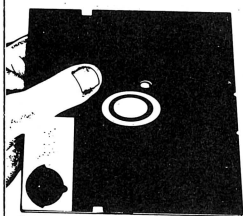
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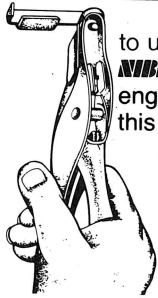
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In all three modes, lower case letters have true descenders and can be underlined. Features include printing of 10, 12 or 17 characters per inch; proportional spacing mode; adjustable line spacing in 1/120 inch increments. Friction feed is standard but an optional tractor feed is available. The serial model, 8600 BR, includes a 4K input buffer. It is designed for asynchronous, half-duplex transmission at speeds of 110 to 9600 baud in standard increments, using a built-in RS-232C or 20mA current-loop interfaces \$1,395. The Centronics parallel model, 8600 BP, includes a 2K buffer and has graphics capabilities. There are two graphics modes available: an 8 dot high resolution and a 18 dot super high resolution graphics mode - \$1,295.

Circle Help No. 113

Leading Edge Products, Inc.

225 Turnpike Street

Canton, MA 02021

(800) 343-6833; (617) 828-8150 (MA)

**RAPID/SCRIBE** data processing printer achieves speeds of 500 characters per second (cps) at 10 characters per inch (cpi) and 540 cps at 12 cpi. The key to the high printing speeds is an 18-needle printhead consisting of two vertical columns of nine each. Since the two columns of print needles are adjacent to each other, two identical columns of dots may be printed at one time, doubling the printing speed of the conventional single column, nine-needle printhead. Features enhanced mode printing with proportional spacing or at 10, 12, 15 and 16.4 cpi at speeds up to 410 cps. Dual-pass correspondence quality mode provides proportional spacing and 10, or 12 cpi at speeds of 100-120 cps. Character sets include Swedish, Danish-Norwegian, German, French, Spanish, Italian and ASCII. High resolution graphics mode provides a dot resolution of either 72 or 144 dots per inch. Options include character font downloading from the host computer, alternate character fonts in PROM, and UPC and Code 39 bar codes. Standard buffer storage is 4.5K bytes, and an additional 16K bytes may be added as an option. Model DP-6500 - \$2,995.

Circle Help No. 112

Anadex, Inc.

9825 De Soto Avenue

Chatsworth, CA 91311

(213) 998-8010



The **Converter** will turn Olivetti and IBM electronic typewriters into computer printers and/or terminals. Printing speeds range from 175 to 230 words per minute. Converters are available for either Centronix type parallel or RS-232C serial input. The serial version can send as well as receive data and is available for IBM models 50, 60 and or 75. Both versions are available for Olivetti ET121 or ET221. The Converter fits inside the typewriter, does not affect normal use and requires no modifications. Serial interfaces have selectable baud rates, hardware or XON, XOFF handshake protocols and a built in self test mode.

Circle Help No. 111

Vertical Data Systems, Inc.

1215 Meyerside Drive, Unit 2

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Canada L5T 1H3

(416) 671-1752

**PrintMate 150** wide-carriage printer prints at 150 characters per second using advanced logic-seeking impact printing. Features 10, 12, 15 or 17 characters per inch. It provides high-density, high-speed correspondence printing, plus double-wide for emphasis. Establish, change or display the operating mode from the front of the printer using a 12-digit keypad. An expandable print buffer takes you from 2K to 68K to provide high-speed interleaved printing with computing. Three paper paths - front, back or bottom. Custom character sets may be downloaded to a PrintMate 150 with a 4K or larger buffer. Their exclusive AP-Pak is available for most popular computers and lets you print in dozens of stylized fonts, in characters up to 3/8-inch high - \$995.00.

Circle Help No. 110

Micro Peripherals, Inc.

4426 South Century Drive

Salt Lake City, UT 84107

(800) 821-8848

## Miscellaneous Hardware

The **Arcade Board** uses the same hardware as many of the coin-operated arcade machines. Plug arcade action and sound into your Apple II for spectacular color graphics with rapid, smooth animation and simultaneous sound effects, using only BASIC. Features 32 sprites available for super easy animation; 16 colors available simultaneously in all 3 graphics modes; 256 x 192 Hi-Res resolution and 64 x 48 Lo-Res resolution; 40 x 24 text mode uses user-defined character sets; 16K on-board RAM; store up to 14 pages of Hi-Res graphics or text; 60 Hz interrupt timer for audio-video timing/synchronization; 3 tone generators with a 9 octave range; 16-level volume controls; noise generator for gunshots, bombs, etc.; automatic envelope control; true NTSC video signal; software video-select switch \$295.00. Two Arcade Boards

can be cascaded to give double of everything. Requires an Apple II or //e.

*Circle Help No.89*

Third Millennium Engineering Corporation  
1015 Gayley Avenue, Suite 394  
Los Angeles, CA 90024  
(213) 1473-2102

With **Scooter's 0-Force Twin Port** you can alternate access between port A and port B at the flick of a switch. Plugging into any Apple I/O game port is faster, safer and more convenient. Fragile plug pins are easily and safely inserted with Scooter's zero-force sockets; just place the plug in position, then flip the lever for a secure connection. A pressure sensitive backing and 3-foot cable allow quick mounting of the port in almost any convenient external location. The cable is color coded for quick identification of correct pin alignment - \$20.00.

*Circle Help No.90*

Ohm/electronics  
746 Vermont Street  
Palatine, IL 60067  
(312) 359-5500

**Saybrook** is the 68000 21/16 bit co-processor for the Apple II. Saybrook transforms the Apple into an awesome micro-mainframe computer, capable of 10-20 times the speed of the Apple, with twice the memory on-board. Features MC68000 32/16 bit processor (identical to apple's Lisa) runs programs ten to twenty times faster than the Apple II. Gives you 128K RAM on-board expandable to 512K on-board. It will run all Apple BASIC, FORTRAN, and Pascal programs ten to twenty times faster. In addition, Saybrook accesses the enormous UCSD p-System library of software, as well as CP/M-68K. Includes the Saybrook 68000 co-processor with 128K RAM on-board; the UCSD p-System (Version IV) with Pascal, FORTRAN-77, and BASIC compilers. In addition, Applesoft-compatible, 68000 BASIC is included. \$1,550.00. CP/M 68K optional. UNIX available soon.

*Circle Help No.91*

Analytical Engines, Inc.  
3415 Greystone, Suite 305  
Austin, TX 78731  
(512) 346-8430

**The Mate** is a strategy game peripheral for the Apple II and compatible computers. It allows the chess player the ultimate in computer usage. Morphy improved chess program has 9 levels of play with four built-in time keepers. Also features hints to improve your game. It can monitor two players and take back unwanted moves. Includes a true sensor chessboard with magnetic chess pieces - no more entering your move on the keyboard. The computer will sense the move and respond with its own, through LED lights on each square of the board. The screen also shows the game in progress. Plug it into any available slot - \$199.95. Quantity price reduction available.

*Circle Help No.92*

Applied Concepts, Inc.  
709 Lingo Drive, Suite 110  
Richardson, TX 75081  
(214) 680-8361

**Com-Protect III** surge/spike protector has six outlets with a 15 Amp rating. Features protection from power outages, power surges, spikes, brown-outs, Radio Frequency Interference and more. Comes in molded case with built-in line cord and a 90 day replacement warranty - \$79.95.

*Circle Help No.93*

Com-Protect Inc.  
Rt. 4-Box 427X  
Slidell, LA 70458  
(504) 641-1316

**Data.clock** multifunction plug-in card is fully compatible with Apple computers including the Apple II, II Plus and //e. Purchaser has the option of ordering the Data.clock either assembled by the manufacturer or in a do-it-yourself kit. Has date, month, and year capability, and the on-board battery has a two to three-year life. There is also an externally accessible EPROM. Price: \$85.00 (assembled) or \$55.00 (kit with easy assembly instructions).

*Circle Help No.94*

P & B Research Consultants  
231 East Grand Blvd.  
Detroit, MI 48207  
(313) 259-5951

The **PRO-100** is an intelligent detachable, capacitance keyboard with enclosure for use with the Apple II or II Plus. It offers 100

keys supporting all existing Apple functions plus horizontal and vertical cursor movement, separate number pad with enter key, auto-repeat, relocated reset key, CAPs lock key, power-ON indicator, upper/lower case (rev. 7 or later), 22 VisiCalc keys, 25 Apple BASIC keys, and 18 programmable keys. Compatible with existing Apple peripherals. Includes a 6-foot interface cord, boot diskette, upper/lower case chip, and user-installation instructions - \$265.00.

*Circle Help No.95*

AMKEY, Inc.  
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**Flexiduct Surge Suppressors** catch surges and spikes before they have a chance to enter your equipment. In a few millionths of a second, common electrical surges and spikes can enter your data processing equipment and cause memory loss, false logic and misregistration. Surges very often do permanent damage to microcircuitry. In billionths of a second (Nanoseconds), Flexiduct Surge Suppressors dissipate surges and spikes from any side of the line (most protect only one side). Model FS-P plugs into the wall outlet to protect that outlet and all other outlets on that circuit. For safety, it is fused to protect from overloads.

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**The Acorn 68000 attached processor** for the Apple II features a 68000 microcomputer with 16MHz clock, 131,072 bytes of RAM memory, 32,768 bytes of ROM memory, two RS-232C serial ports up to 9,600 bps, one million bps interface with Apple, seven levels of vectored interrupts, real time clock and timer, separate case and power supply. Software uses only one peripheral slot in the Apple. Invisible operation with Applesoft or Pascal, compatible with compilers and 6502 assemblers. Includes a 68000 assembly language development system - \$1,495.00.

*Circle Help No.97*

Acorn Systems, Inc.  
4455 Torrance Blvd., #108  
Torrance, CA 90503  
(213) 371-6307

**EPROM Programmer** is microprocessor based. Programs 2716, 2732, 2732A and 2532 EPROMS. Zero insertion force sockets are standard. Features 25 or 22 volt programming voltage option; copy from EPROM to EPROM automatically; RS-232 interface with selectable baud rates. Includes a power supply and thorough user documentation including example software drivers for popular computer systems, including Apple, IBM-PC and CP/M Command set can be used from host computer or terminal - \$195.00.

*Circle Help No.98*

Boulder Logical Testing, Inc.  
P.O. Box 902  
Boulder, CO 80306

**AppleChips Chip Kits** provide step-by-step instructions and replacement integrated circuit (IC) chips so anyone can fix most Apple II and II Plus system failures. Two kit types are currently available. The Motherboard Kit, Type MK-2-1, provides at least one of every IC you will need (except the 6502 microprocessor and Apple ROMs). It contains 41 ICs of 32 types, an IC puller, and a Troubleshooting Guide. The Disk Drive/Controller Kit, Type KD-2-1, provides ICs for servicing one Apple disk controller card and two Apple Disk II drives. It contains 15 ICs of 10 types and the Troubleshooting Guide. Extensive manual helps in diagnosing both motherboard and disk drive failures, and allows users with no electronics training or experience to fix most single IC failures (the most common kind). You CAN do it YOURSELF! Suggested retail price for the MK-2-1 is \$49.95 and for the DK-2-1 \$34.95. Available through many IAC member clubs at special prices. Not for the Apple //e. Apple-Dayton, Inc. is the Apple users group in southwestern Ohio. The AppleChips Chip Kits and Troubleshooting Guide have been developed and extensively tested and improved during the past year through actual use by Apple-Dayton Members.

*Circle Help No. 66*

Apple-Dayton, Inc.  
P.O. Box 1666  
Fairborn, OH 45324

**EPROM Programmer Model EP-2A-79** has been in the field for three years. Software is available for most all of the microcomputers including the popular CP/M, FLEX, HDOS operating systems. Driver packages available for F-8, 6800, 6809, 8080, 8085, Z-80, 1802, 6502 and 2650 based systems. Compatible with Apple and others - \$169.00. Personality modules are from \$17.00 to \$39.00.

*Circle Help No.99*

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Blueg Wood 127  
Earlsville, VA 22936  
(804) 973-5482

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*Circle Help No.100*

Datascan Software  
516 5th Avenue  
New York, NY 10036  
(212) 706-5907

**DX-1 Sound Effects System** features digital reproduction of real sound. Image at the touch of a key reproducing the sound of hands clapping, sounding identical to a real hand clap; or a whistle, a finger snapping or even the sounds of an eight piece drum set (even cymbals). Twenty-two pre-recorded (digitally) sounds are included, with countless ways to vary each one. Play drum sounds in real time on the Apple keyboard. Program your own sequences or select pre-programmed sound sequences. Load/Save programmed sequences on disk. Works with Apple //e also - \$139.95.

*Circle Help No.101*

'Decillionix  
P.O. Box 70985  
Sunnyvale, CA 94086  
(408) 735-0410

**The MicronEye Bullet** is a solid state digital camera specially designed for your Apple II Plus. Includes all hardware, software and optics necessary for plug-and-go operation. The camera has 128 x 256 element resolution capable of transmitting up to 15 frames per second. Electronic shutter can be manually or software controlled. Several sample programs are included which allow the user to explore the capabilities of the MicronEye. Software allows you to continuously scan, freeze frame, frame store, frame compare, print to Epson printer or produce pictures

with shades of grey. Source code is provided for all software on an unprotected diskette - \$295.00.

*Circle Help No.102*

Micron Technology Incorporated  
2805 East Columbia Road  
Boise, ID 83706  
(208) 383-4000

Upgrade and get //e features on your Apple II. Up to 5 keyboard features with the **Repeater**. Auto repeat is invaluable. Repeats any keypress, including control characters for scrolling, rubout, etc. Adjustable delay to match your typing touch. On/Off control. High Speed Cursor makes Apple's REPT key a speed control to double the repeat rate of any keypress. Zip through text or across a VisiCalc spreadsheet to get there fast. A must for 80 column displays. Shift-Key modification option gives you the 'standardized' connection while leaving the Game I/O open with our plug-in connector. Supported by most popular word processors and many other programs. Works only with certain software and/or most 80-column boards. Easy installation. Open top and plug onto 25-pin connector between keyboard and encoder board (fits Rev .7 or later) \$24.95. With Shift-Key modification - \$34.95.

*Circle Help No.103*

High Order Micro Electronics Corp.  
17 River Street  
Chagrin Falls, OH 44022  
(216) 247-3110

**Microvox text-to-speech synthesizer** can announce data transmitted at high baud rates over telephone lines or serve as an unlimited vocabulary audio interface for telephone transaction applications. Features include 64 digitally programmable levels of inflection, a 6K text-to-phoneme algorithm, 750 character buffer, RS-232C serial connector, music and sound effects capability, and adjustable baud rate. Attached to a terminal keyboard, Microvox can function as a typewriter for the blind or as a communicator for the vocally impaired. Every ASCII character is recognized (including punctuation) as it is typed and can be echoed automatically - \$295.00.

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Woodmere, NY 11598  
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Circle Help No.106

ALF Products, Inc.  
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An **ALIS automation system** together with your Apple II can eliminate manual recording and setting of instruments. ALIS systems can work with pH meters, strain gauges, timers, positioners, microbalances, flow meters, BCD devices - in short almost any device which accepts or generates an analog or digital signal. Each ALIS system is complete with preassembled hardware, from Apple interface to cabling, terminal box and test switches - as easy to install as a printer. Interface software lets your Applesoft programs talk directly with the real world at up to 10,000 data points per second. Display results with a modifiable hires graphing system. Documentation of over 150 pages includes sample programs and application notes to assist in automating your lab. Models include Analog Output - 2 channels (\$841), Analog Input - 16 channels (\$1,149), Precision Analog Input - 16 channels (\$1,517), Digital Input/Output - 32 bi-directional channels, quad timers, interrupts (\$1,600). Requires a 48K Apple with Applesoft and DOS 3.2 or 3.3.

Circle Help No.107

Eco-Tech, Inc.  
2990 Lake Lansing Road  
P.O. Box 776  
East Lansing, MI 48823  
(517) 337-9226

The new **Polaroid computer camera** connects directly to your personal computer with a software package that allows you to get 3.25 x 4.25 inch color prints or conventional 35mm or new Polaroid Autoprocess 35mm slides from monochrome monitors. The system lets you choose from a palette of 72 colors, and transforms black and white graphics into high resolution color prints and transparencies. Graphics created on color monitors can be directly transmitted, or colors can be reassigned. Pricing, exclusive of software, starts at under \$1,000. VideoPrinter model 4 con-

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Circle Help No.108

Polaroid

575 Technology Square  
Cambridge, MA 02139  
(800) 225-1618; (617) 547-5177

The **DTACK Grande** is an Apple compatible 68000 microprocessor board. With an effective speed of 10 MHz with no wait states, this board has one megabyte of memory. It is capable of multi-tasking using interrupts, which will give you the luxury of running more than one program at once or setting up type-ahead buffers or print spoolers. HALGOL is a high speed BASIC-like language that runs at close to 68000 Assembly language speeds. It is currently under development including Apple BIOS which turns the Apple into an Input/Output handler exclusively, and lets the 68000 take over and run things. For more information contact the manufacturer.

Circle Help No.109

Digital Acoustics  
1415 E. McFadden, Suite F  
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(714) 835-4884

## SOFTWARE Business

**Safety Director** calculates project safety statistics in accordance with ANSI Z16.4-1977 standards for the corporate safety director who wishes to compile reports and statistics for several projects or facilities by facility and division groups. The programs will maintain statistics on an individual project or facility basis, and compile cumulative rates for each division group. Also compile by divisions or on a company wide basis. The report data generated by this series of programs is on a monthly, annual and inception period of time basis. Generates average number of employees, man-hours worked, workman compensation claims, recordable cases (no lost-time), lost day cases, total lost days, ANSI Z16.4-1977 rates for each. Requires an Apple II (any type).

Circle Help No. 122

The Specialty Software Company  
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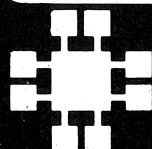
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Southwestern Data Systems  
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Santee, CA 92071  
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recognition as well as counting. Word Power is a drill and practice program designed to help anyone increase his or her vocabulary. The disk includes several practice files and allows users to input other specific files.

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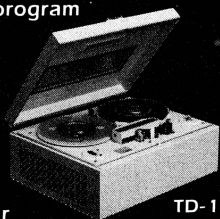
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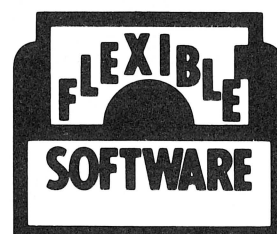
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*Circle Help No. 133*

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Florissant, MO 63032  
(314) 741-6409

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*Circle Help No. 132*

Consultant Systems, Inc.  
3704 State Street, Suite 311  
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**Psychic Defender**, a new electronic tool for training intuition, is designed to increase the player's awareness of internal signals ("gut feelings") that accompany accurate intuitions of the future. Game begins with a display of a six-piece pie. The player uses a radar-like beam to sense which of the six target areas will be chosen by the Apple's pseudo-random generator as its target. When the player presses the "fire" button, the target is generated. A novel feedback system rewards the player if he picks the correct half of the screen. For each shot he has a 50-50 chance of losing a "man." Saves the highest 10 winning players' names \$51.50.

*Circle Help No. 154*

Alan Vaughan  
408 Ivy Street  
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(213) 246-3113

You're the lucky apprentice who gets to sort all the tantalizing gumballs at the famous Sticky Sole **Gumball Factory**. The job is not without its problems, however. Overzealous

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*Circle Help No. 153*

Broderbund Software - at your local dealer.

In **I.Q. Baseball** the flag waves in the breeze - your computer plays "Take Me Out to The Ball Game" - you hear the last bars of the National Anthem and then - Play Ball! The pitcher hurls the "question ball" at you. Some are easy - right over the plate. Some are tricky curves. If you answer correctly, the ball zooms out of the infield and you race toward first. Depending on the difficulty of the question, you'll hit doubles, triples, even homers - but only if you really know your baseball. Features realistic animation and the sounds you hear at a real ball park. Requires 48K and DOS 3.3 on an Apple II (any type) \$24.95.

*Circle Help No. 152*

Davka Corporation  
845 N. Michigan Avenue Suite 843  
Chicago, IL 60611  
(800) 621-8227; (312) 944-4070 (IL)

**Parthian Kings** game concerns feudal civil war - many nobles are declaring themselves king of Parthia. The whole situation is wide open for a brilliant commander, a great strategist and a leader of men, namely you. A 1 to 4 player game, in which you create, buy and command your own army, and use a great wizard to do your bidding and casting of terrible spells upon your enemies. On diskette for all Apple II computers with 48K of memory.

*Circle Help No. 151*

Avalon Hill Game Company

**S.C.I.M.M.A.R.'S** (Surface Contra-Gravity Individual Manned Mobile Anti-Vehicle Raiders) is a game of gladiatorial armor combat in the far future. Heroes drive personal combat vehicles more akin to modern jets than tanks, with immense speed and acceleration. It is combat of maneuver, reflex and quick thought, where only the best survive. On diskette for any Apple II computer with 48K of memory \$30.00.

*Circle Help No. 150*

Avalon Hill Game Company

**T.A.C.** (Tactical Armor Command) is a game of armored combat during World War II. You control individual tanks, anti-tank guns, and infantry squads. For one or two players, featuring Hi-Res graphics, enhanced sound and stimulating challenge. Five different scenarios are available for Meeting Engagement, Rear Guard, and Static Defense, to Breakout and Stalemate. The players control up to eight vehicles, guns and squads simultaneously, utilizing the equipment for either the German, British, Russian or American forces. A simula-

tion for the most demanding wargamers, the game is on diskette for any Apple II with 48K of memory \$40.00.

Circle Help No. 149

Avalon Hill Game Company

4517 Harford Road

Baltimore, MD 21214

**Road Warriors** has 3-D high resolution graphics for 1 or 2 players. What would you call a world of renegade drivers? (*California*. —PCW.) A place filled with the most dangerous and reckless pilots ever to punch metal over asphalt. The highway outlaws of society, banished to a planet with 50,000 miles of empty roadway and each other. The outsiders call it prison - the Road Warriors call it heaven. Features pause game and sound on/off; individual high scores and names kept; graduated levels of difficulty. Requires an Apple II or II Plus with 48K and DOS 3.3 \$29.95.

Circle Help No. 148

Morningstar

39 Florence Street

San Francisco, CA 94133

(415) 441-2535

You are caught deep in the caverns with vicious white rats biting off your tail and the enchanted frog blocking the passage in front of you. Your objective . . . recover the stolen jewel of your king. You're in control, what do you do next? Boa will help you if you know how to control him. Continuous sound effects and music throughout the game. Experience the **Adventure of Boa** . . . a high resolution arcade style game created by Micro Magic for strong hearted, gamers-men. Requires an Apple II with 48K and disk \$29.95, plus \$2.00 shipping.

Circle Help No. 147

Micro Magic

Condor Computing, Inc.

908 Memorial Parkway, N.W., Suite C

Huntsville, AL 35801

In **Evolution**, only the strong survive. You start as an amoeba trying to advance up the evolutionary chain to become a human. To attain this goal you will have to go through 6 distinctively evolutionary steps: an amoeba fighting microbes while trying to eat DNA; a tadpole eluding fish to catch waterflies; a rodent chased by snakes while looking for cheese; a beaver attacked by alligators while building a dam; a gorilla protecting his food from monkeys; a man battling genetic mutants in an elastic background. Features up to 99 levels; keyboard or joystick control; machine language speed; colorful Hi-Res graphics; keeps the top 10 scores; arcade sound and full convenience controls. For the Apple II or II Plus.

Circle Help No. 146

Sydney Dataproducts, Inc.

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San Diego, CA 92108

(619) 298-5886 (USA); (604) 734-8822

(Canada)

**Crypto Cube** is a family word puzzle. Work your way through the many word puzzles

that come with the game. Then, enter your own words or spelling homework, etc. into new puzzles. You'll become a word fiend - spending hours paging through the dictionary to find words that will stump your friends. **Spellicopter** is an action-packed spelling game. You'll fly perilous missions through crowded skies and mountainous terrain to rescue words.

Circle Help No. 145

DesignWare

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If you think balancing a pile of blocks is kid's stuff, think again. Building a stable tower in this game takes muscle, a keen eye and a good bit of planning. **Barnaby**, Highrise's master builder, supplies the muscle. But it's up to you to select blocks of various shapes and sizes from any of five chutes. Then load them onto the springboard in any of five positions and flip them up onto the pile. Plan your block selection and

placement correctly and you build a balanced pile. Stack them wrong and your pile comes crashing down. Each block you add racks up more points. Complete a pile and Barnaby takes you to the next level of difficulty. But hurry, you're piling blocks in a race against the clock.

Circle Help No. 144

Microlab, Inc.

2699 Skokie Valley Road

Highland Park, IL 60035

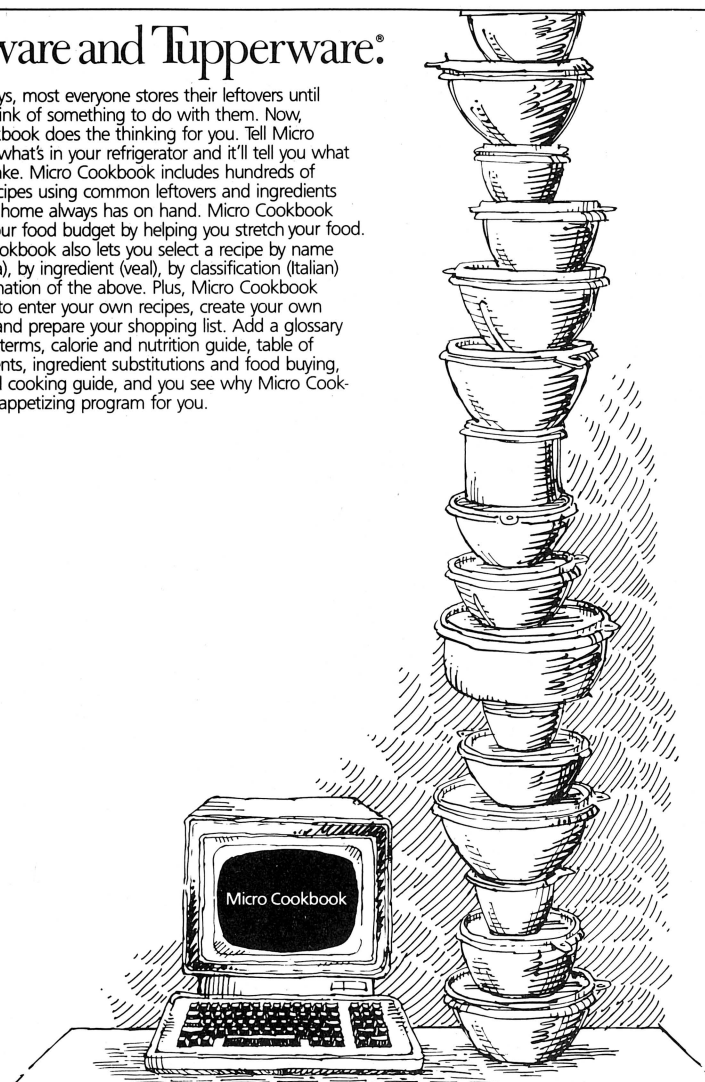
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color high resolution graphics, smooth animation in 100% machine language, and superb sound effects. Best of all Pinball Paradise comes on an unlocked disk for easy back-up. Requires Apple II or II Plus with 48K, DOS 3.3, and paddles \$24.95.

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*Circle Help No. 158*

East Coast Computer Labs  
221 N.E. 23rd Street  
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**Computer Slide Express** service converts computerized charts, designs, graphs and graphics to 35mm color slides for \$6.00 each. Standard size or enlarged color or

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*Circle Help No. 159*

Visual Horizons  
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Rochester, NY 14623  
(716) 424-5300

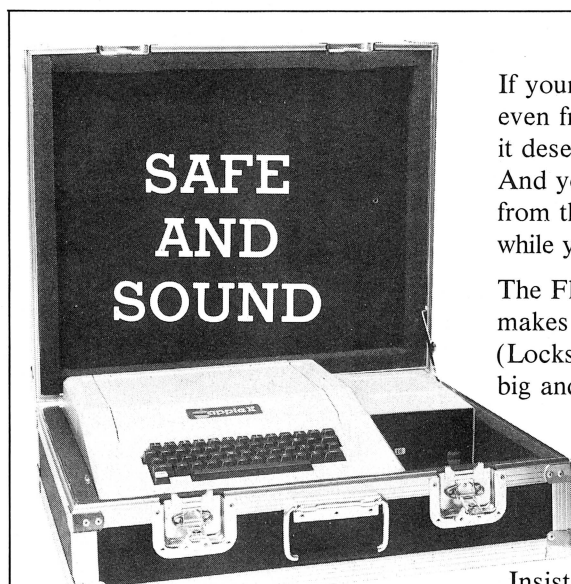


**SOFTPLOT/BGL** (Basic Graphics Language) is a device-independent graphics extension system that supports Microsoft BASIC and can make use of dot matrix printers for high-resolution graphics, as well as plotters and displays. Minimal hardware and software requirements can significantly reduce the cost of producing and using graphics applications, since even the simplest BASIC program can easily support a wide variety of hardware configurations. A preprocessor and mergeable subroutines are used to permit programming in high-level HP and Tektronix-like commands such as PLOT X,Y. Supports viewport, window, rotation, text justification, color, dashing, and 3D perspective. Full use is made of available device features \$200.00. Includes a tutorial manual, EMUPLOT printer dump module, pre- and de-processor, library and driver subroutines for various displays, plotters, and printers. A demonstration program is also supplied CP/M or MS-DOS.

*Circle Help No. 157*

Graphic Software, Inc.  
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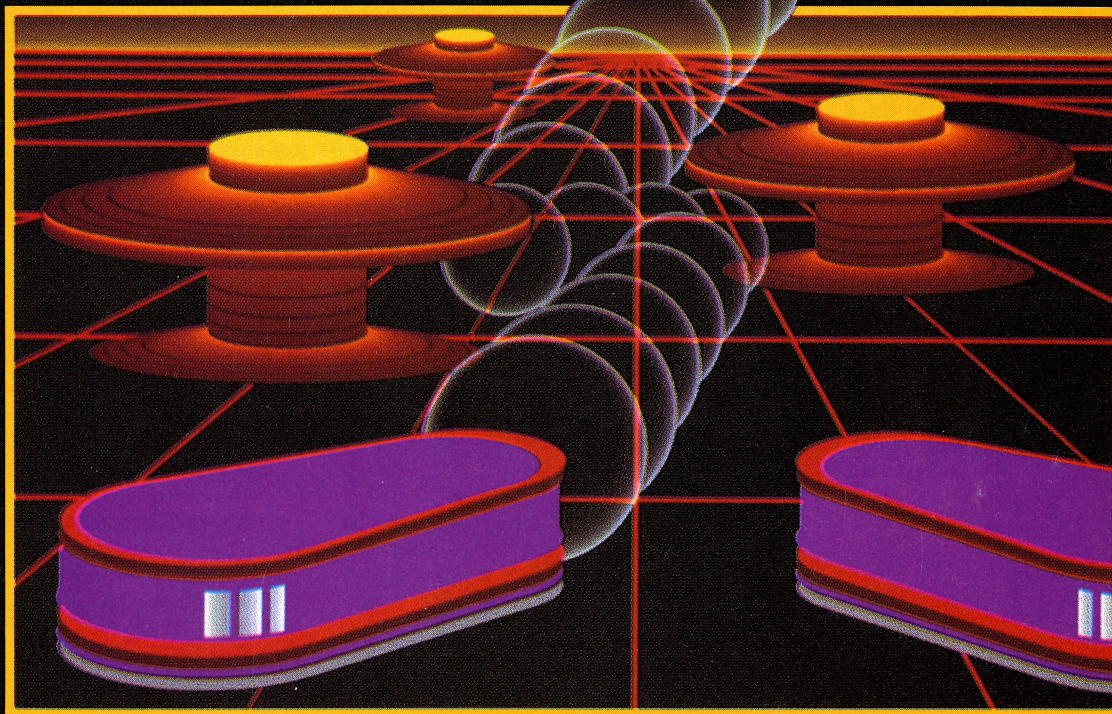
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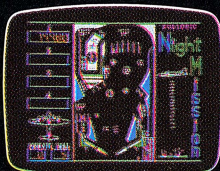
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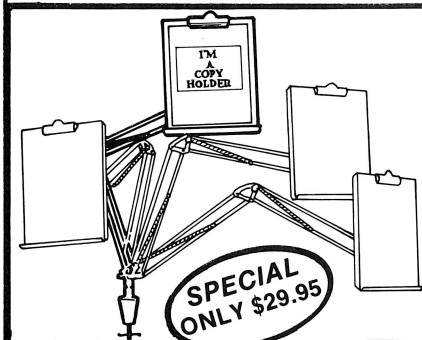
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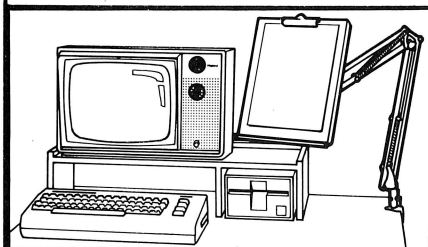
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Luster Software Services  
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**Ampergraph** relocatable graphics utility for the Apple II and //e adds twenty-two Applesoft commands that allow effortless generation of professional looking plots of scientific or financial data. All of the necessary scaling and screen formatting is accomplished with just a few, simple Applesoft lines. This utility extends Applesoft BASIC - it does not stand alone. The additional commands are all preceded by the ampersand to call the appropriate utility routine: scale, limit, axes, grid, frame, log X, log Y, label axes, label, vlabel, center label, center vlabel, draw, penup, cross, open square, closed square, open circle, closed circle, error bars, and dump (which works with the following) - \$45.00. **Amperdump** is a high-resolution graphics dump utility which can be used either in menu-driven mode, or directly from an Applesoft program with or without Ampergraph. Compatible for the following printers: Epson MX- FX-80 or MX-100, Apple dot matrix, NEC PX-8023A-C, C. Itoh 1550, 8510A/B, 8600. Permits horizontal magnification of up to 3 with Epson printers, 12 with others. Vertical magnification of up to 9 is achieved with Epson printers, 6 with all others. Features normal/inverse dumps, adjustable horizontal tab, relocatable code - \$40.00.

Circle Help No. 155  
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121 N. Allen Street  
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(608) 238-4875

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Circle Help No. 167  
Vanguard Systems Corporation  
4226 Center Gate  
San Antonio, TX 78217  
(512) 656-1093

**Custom Micro Systems Editor/Assembler (CUMSEA)** is an Apple II editor/assembler for teaching 6502 assembly language and for advanced computer literacy

courses. Includes a diskette with eight programs, three test files, two demonstration files, user manual. Two of the eight programs are not available for student use; they are used to "foolproof" the remaining six programs and to provide a menu from which these six programs may be selected. These consist of an editor, an assembler, a utility program, and three format-converting programs. In addition to operating information, the manual contains a self-teaching familiarization section, five appendices, and a 10-page cross-referenced index - \$26.50 for teacher and educational use only.

Circle Help No. 166  
Custom Micro Systems Ltd.  
16921 108 Street  
Edmonton, Alberta  
Canada, T5X 3B2

**The Cheap Assembler** is a mnemonic assembler for the Apple II. Now, for less than the cost of a game, you can have a complete assembler/editor system at your disposal. System features include unlimited length labels, free-field programming, two-pass RAM/disk-based assembly, text editor with ten commands including character insert and delete, line insert and delete, type-over modifications while viewing the preceding lines on the screen, interactive operation, and explanatory debugging messages. Edit, assemble, and run a program without ever leaving the system. Also included are a tutorial-style manual and demonstration routines on disk. Not copy protected. Requires an Apple II with 48K and DOS 3.3 - \$20.00.

Circle Help No. 165  
Thunder Software  
P.O. Box 31501  
Houston, TX 77231  
(713) 728-5501

**TransForm** is a structured translator for Microsoft BASIC which does away with the constraints of line numbers and the single line IF. Adds the high level structures of the block IF - ELSEIF - ELSE - ENDIF, REPEAT - UNTIL, and ON - GOTO - ENDGOTO. Symbolic labels are used and an include - declare feature has been added to enable you to build a library of everyday subroutine modules. Tutor teaches with detailed examples \$39.95. TransForm Standard begins with a more complex example - \$39.95. TransForm Expert provides the additional utilities of a source code formatter, destination code optimizer (for use with BASCOM 5.3) and a "REL" file disassembler. - \$39.95.

Circle Help No. 164  
Master Computing Inc.  
11 Regency Hills Drive  
Greenville, SC 29615  
(800) 845-7055 (Orders);  
(800) 244-8174 (Technical questions)

**Z80 Relocating Macro Assembler** directly generates COM, HEX, or REL files. Flexible REL format allows external bytes and words with complete math operations on them



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*Circle Help No. 163*

SLR Systems

1622 North Main Street

Butler, PA 16001

(412) 282-0864

**The Programmer** from Sams is a BASIC code generator which provides a programming "shorthand" to take your ideas and write the appropriate lines of BASIC - so programming is fast and error-free. Through a series of "menus", you can select the direction of function you want the program to perform. Code is generated as you go along. Stop and make changes without destroying your previous work. Comes with a complete instruction book which clearly explains how to create programs for almost any application \$199.95. It works with the Apple II Plus.

*Circle Help No. 162*

Howard W. Sams & Co., Inc.

4300 West 62nd Street

Indianapolis, IN 46206

(800) 428-3696; (317) 298-5566 (IN)

## Music

**Music Master** interface card (Slot 2 on a 48K Apple type computer) permits the user to create, play and store music. Complete package includes detailed instructions, keyboard coding labels, and two mini stereo speakers with audio cables. With an adaptor (not provided), hook up a stereo amplifier with external speakers. Utilize simple keyboard commands to play preprogrammed music; create custom music; develop new music compositions; add special sound effects (gunshot, explosion, laser cannon fire, whistling aerial bombs, sounds of missiles launching or rockets firing); or designate melody, tempo, chord, beat and rhythm. Works in progress can even be saved on a disk for later completion - \$199.95.

*Circle Help No. 161*

OPCS, Inc.

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**Roland Compu-Music** computer/music synthesizer system allows your computer to write, program, change and store musical compositions of up to eight voices, plus a seven voice electronic drummer. The Compu-Music hardware (CMU-800) is a

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## Utilities

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The **Screen Printer** is an Apple Pascal procedure that will transfer the exact contents of the screen onto any printer. Either the primary or secondary text screen may be printed, or both side-by-side for 80-column display. The Videx VideoTerm 80-column card is also supported. Requires an Apple II Plus with Apple Pascal and any printer - \$25.00.

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**Disk Recovery System (D.R.S.)** can actually read information from damaged sectors. Features include the ability to read disks that were recorded off center, or read errors caused by hub damage. D.R.S. will type, grade and fix all possible files and make recovered files accessible for conventional editing. All of this is totally automatic. \$100.00.

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**Confidential Information Advisors** is a collection of five sophisticated disk utilities: Tricky Dick examines, records, deletes, and edits individual sectors on normal and most protected disks. The Linguist reads in a trackful of raw data, translates all the address information, and allows you to inspect the track's formatting. The Tracer rapidly searches normal and most protected disks for up to six strings simultaneously (specified in ASCII or hex). It also verifies disk formatting, and sniffs out all hidden catalog or VTOC sectors. The Code Breaker keeps programs and text files from prying eyes by encryption during disk storage. The Tracker closely shadows the disk drive arm, carefully recording all its movements and operations. Use it to locate the precise trouble spots on a clobbered disk, to determine sector skew patterns, to discover the location of hidden "nibble-count" tracks on protected disks. The CIA Files is a 50,000-word book designed to turn you into a disk expert. Contains a hand-holding tutorial on all aspects of the Apple disks. All programs are unprotected. Requires an Apple with 48K and DOS 3.3.

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**MicroShell** gives new power for CP/M systems. Features include: elimination of the warm start at disk changes; finds files automatically by searching through all disks, or selected disks, even when a program calls for a file. Run WordStar, for instance, from any disk or user number and MicroShell finds the necessary WordStar files; enter a string of CP/M commands on one line; edit the last command line; redirect output to a file; type a file with screen control; etc. Sets up menus to make your system friendly. Many more sophisticated features for advanced programming - \$150.00, Manual only \$25.00.

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**Smartkey** is a unique utility that can redefine any ASCII character or function key to become anything you want. For example, "#" can become "pip b:=a:.pas[v]". With a single stroke, a key can represent a chosen character or string at the system level or within a program without rewiring or soldering. Completely user-transparent, resides on the top of memory and intercepts calls to the BIOS, translating system input to whatever you desire. Change a key definition while another program such as WordStar is in operation, without interrupting it. For programming, data entry or word processing \$60.00.

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**Master Key+** allows you to move protected programs to a hard disk system or a standard Apple formatted disk. Master Key+ lets you stop, list, change or modify most programs, search through memory, display memory in HEX/ASCII, disassemble ranges of memory, step through machine language programs one instruction at a time and display them in HEX, ASCII, or Binary. Requires a 48K Apple II or Apple II Plus with any 16K expansion card and one disk drive \$49.00.

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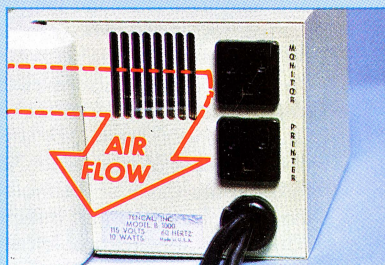
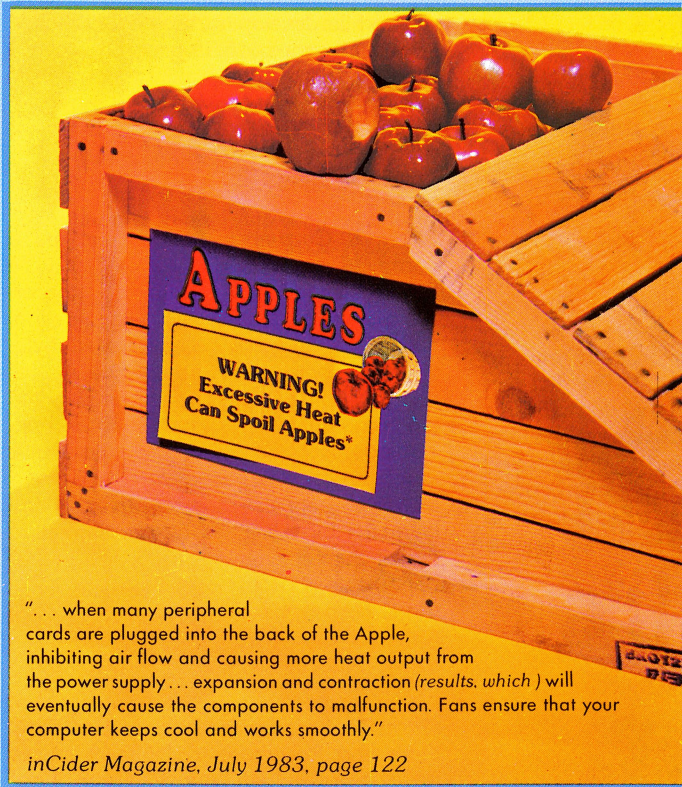
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## Word Processing

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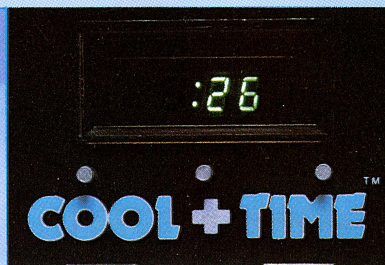


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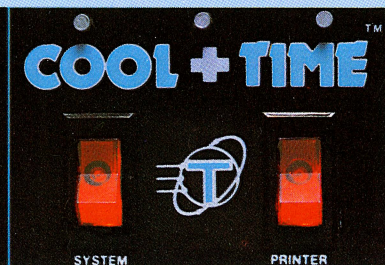
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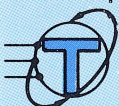
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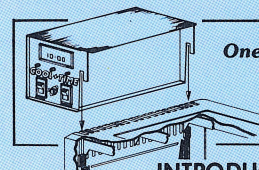


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(415) 548-2805

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**Game Techniques in Applesoft BASIC** by Peter and Rosemarie Gabriele. It shows how to program animated games in logical and easy-to-understand language. It is designed for those who are tired of just playing computer games and who want to be more creative. Also available: **How to Select and Buy a Personal Computer** by Ursula Connor, written by an expert with over 15 years of experience. Is said to cut through the maze of technology and lead the small businessman directly to a solution for his specific problems.

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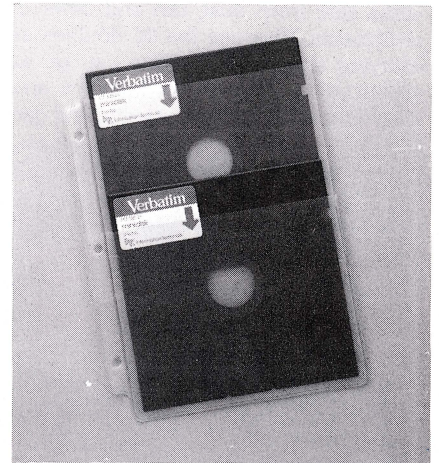
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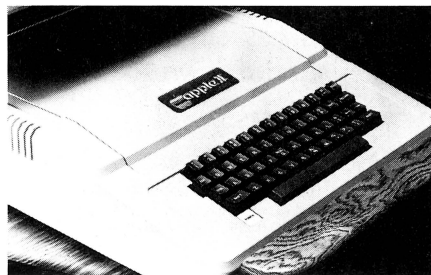
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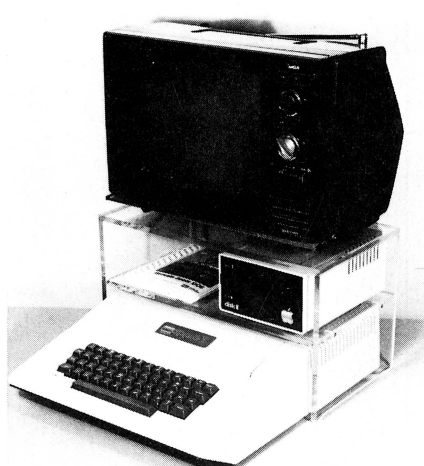


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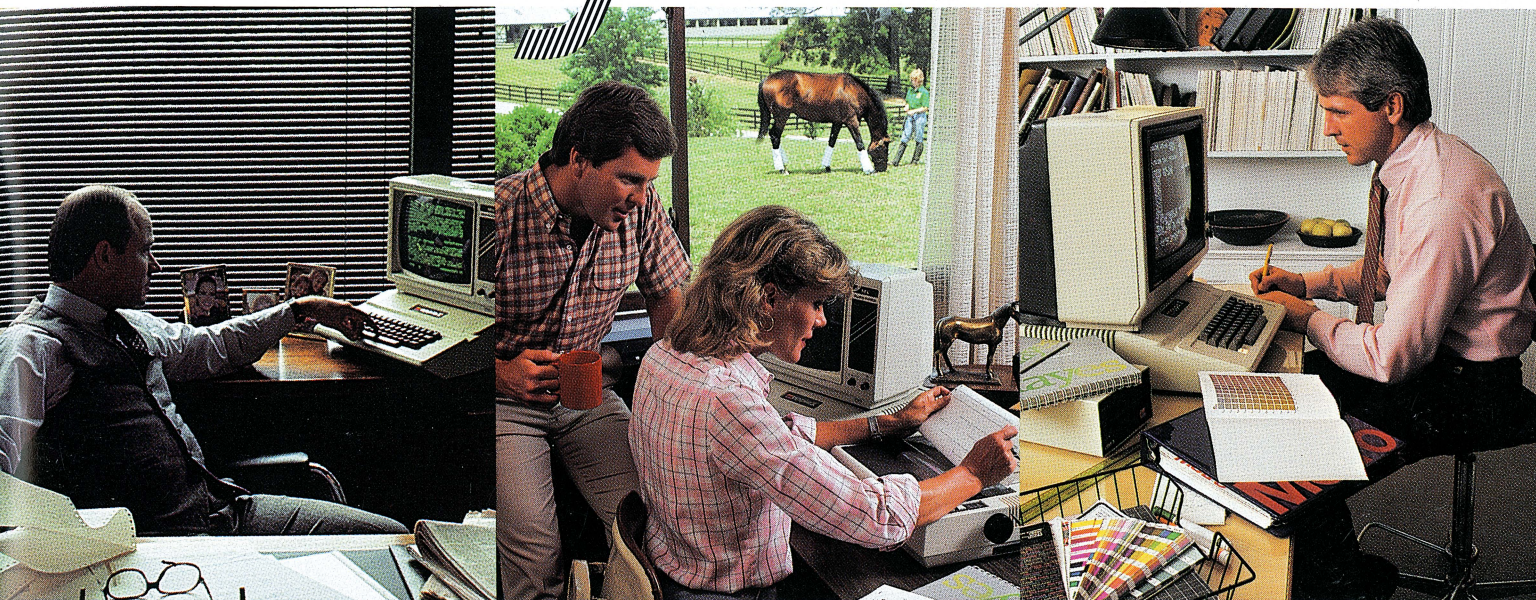
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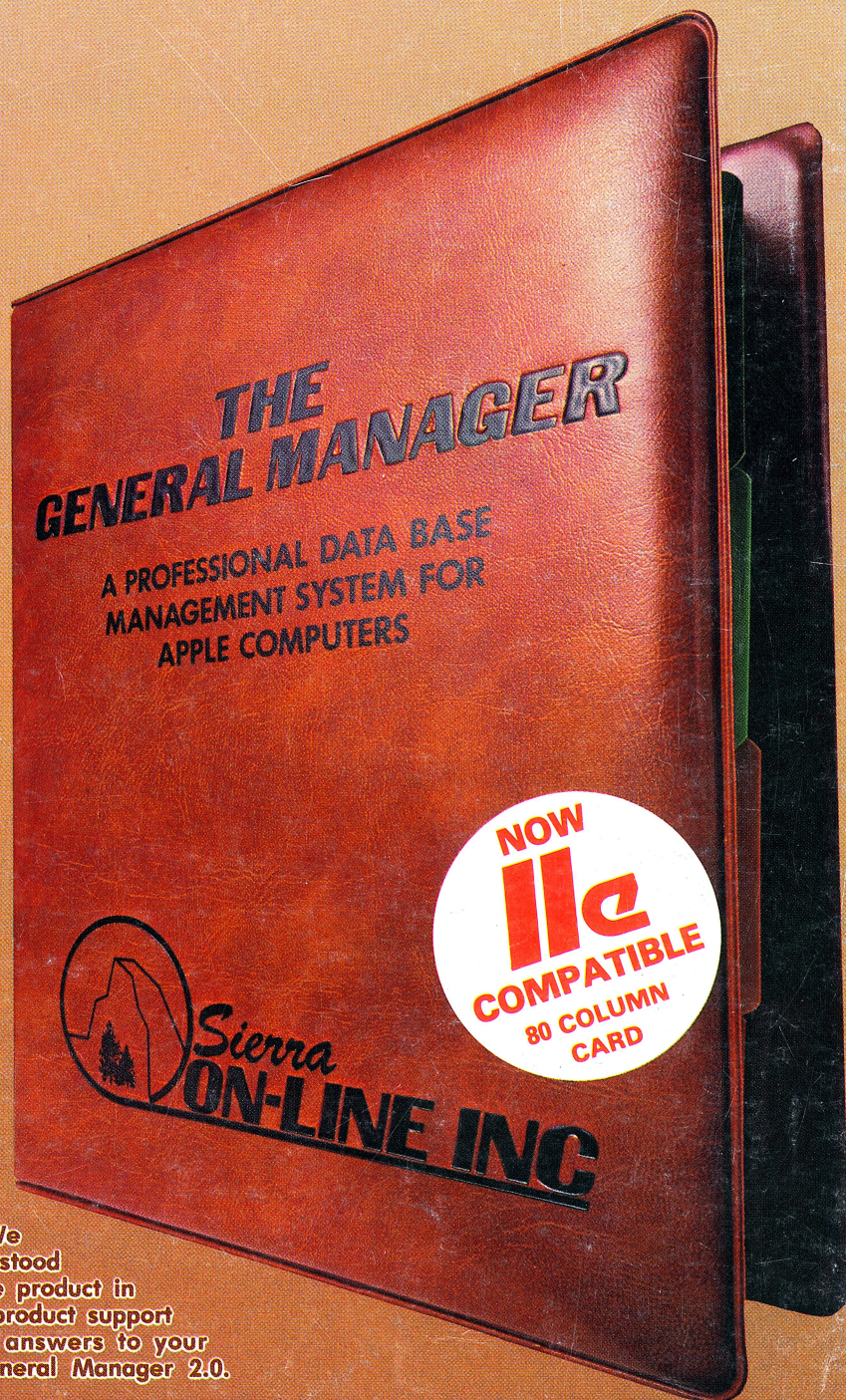


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